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09/08/99

PROJECT: 17BP.5.H.4

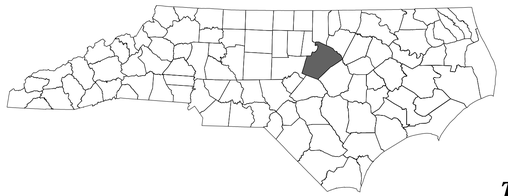
CONTRACT: DE00259

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

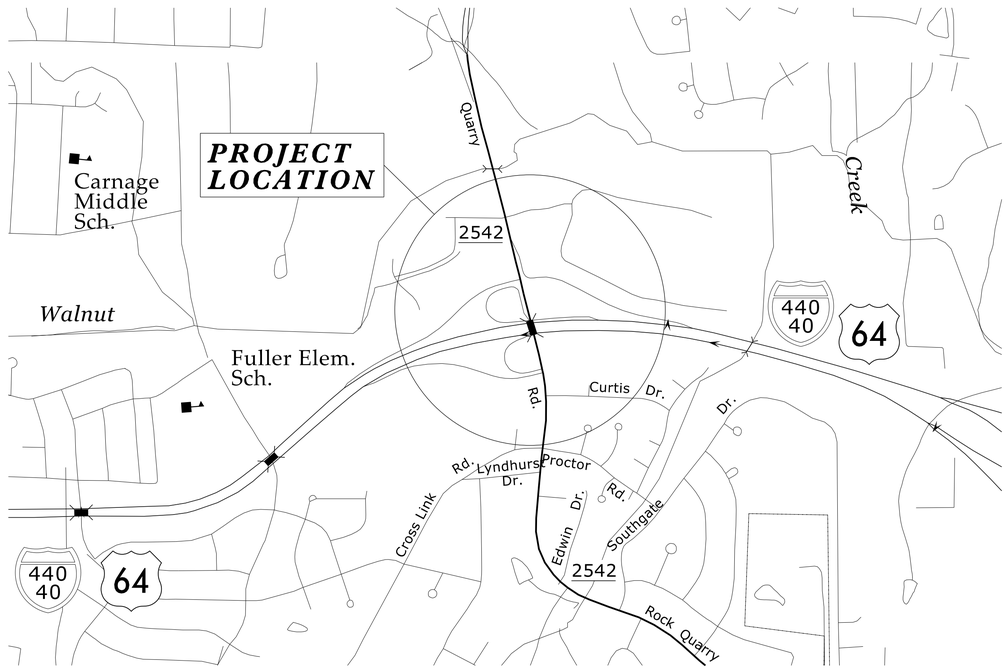
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.H.4	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.5.H.4		PE
5BPR.3.1		CONST



LOCATION: ***BRIDGE #316 ON SR 2542 (ROCK QUARRY RD.) OVER I–40/I–440***

TYPE OF WORK: ***BRIDGE PRESERVATION – SUBSTRUCTURE REPAIR USING SHOTCRETE AND EPOXY RESIN INJECTION, PAINTING STRUCTURAL STEEL, BRIDGE JACKING, CAP DEMOLITION AND SEAT REPAIR, AND ELASTOMERIC BEARINGS***



DocuSigned by:
David Ruggles
C462768DF412422...
6/13/2018

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

BRIDGE # 316 – ADT 2015 = 27,000

PROJECT LENGTH

BRIDGE # 316 – 0.056 MILE

Prepared in the Offices of:

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750
Firm License #: C-1051
www.stewartllc.com
PROJECT #:H16016.00

2018 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 25, 2018

DAVID RUGGLES, PE
PROJECT ENGINEER

JEFF LOFTUS, PE
PROJECT DESIGN ENGINEER

LISA GILCHRIST, EI
NCDOT CONTACT

6/13/2018
::\000_RockQuarryRehab_TITLE01.dgn
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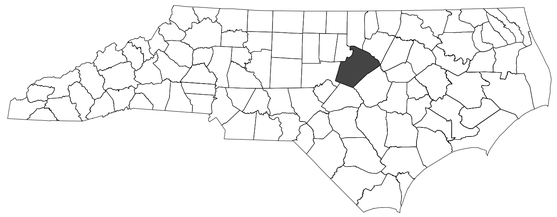
09/08/99

PROJECT: 17BP.5.H.4

CONTRACT: DE00259

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.H.4	2	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.5.H.4		PE
5BPR.3.1		CONST

LOCATION: ***BRIDGE #316 ON SR 2542 (ROCK QUARRY RD.) OVER I–40/I–440.***

TYPE OF WORK: ***BRIDGE PRESERVATION – SUBSTRUCTURE REPAIR USING SHOTCRETE AND EPOXY RESIN INJECTION, PAINTING STRUCTURAL STEEL, BRIDGE JACKING, CAP DEMOLITION AND SEAT REPAIR, AND ELASTOMERIC BEARINGS***

INDEX OF SHEETS

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DocuSigned by: David Ruggles C462768DF412422...
6/13/2018

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6/13/2018
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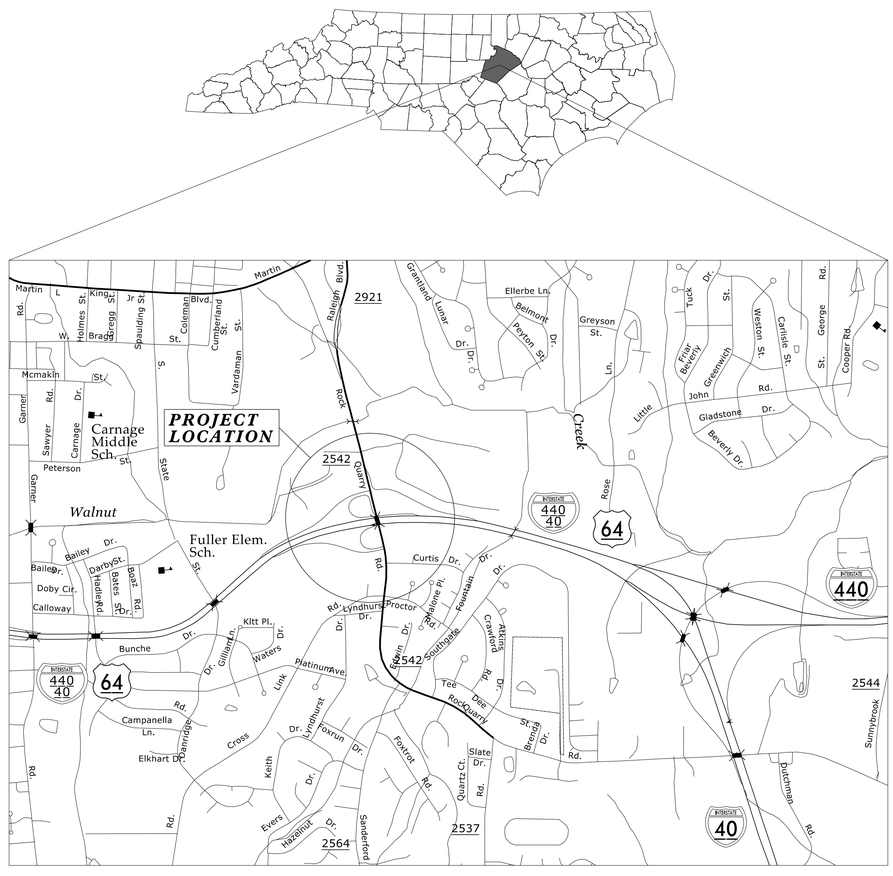
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY

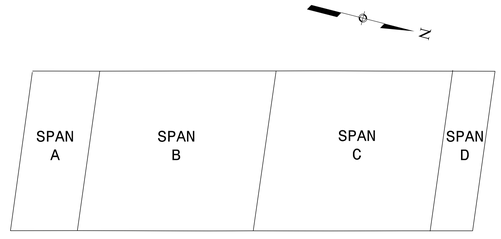


LOCATION: BRIDGE #316 ON SR 2542 (ROCK QUARRY RD.) OVER I-40/I-440

TYPE OF WORK: BRIDGE REHABILITATION

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND MANAGEMENT STRATEGIES
TMP-1B	GENERAL NOTES & PHASING



SPAN DESIGNATIONS

DAVID RUGGLES, PE *TRAFFIC CONTROL PROJECT ENGINEER*

ELIZABETH PHELPS, EI *TRAFFIC CONTROL PROJECT DESIGN ENGINEER*

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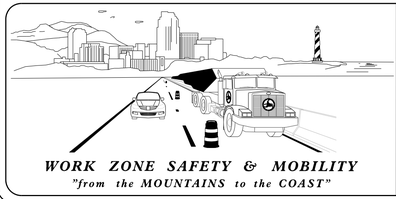

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 814-5000 FAX: (919) 771-2745

JOSEPH HUMMER, PE *STATE TRAFFIC MANAGEMENT ENGINEER*

TRAFFIC CONTROL PROJECT ENGINEER

MICHAEL STEELMAN *TRAFFIC CONTROL PROJECT DESIGN ENGINEER*

TRAFFIC CONTROL DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

STEWART
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Firm License #: C-1051
www.stewartinc.com
PROJECT #:B11001

APPROVED: DocuSigned by: David Ruggles C462768DF412422...

DATE: 6/12/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

SHEET NO.
TMP-1

17BP.5.H.4

PROJECT:

5/9/2018
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USER:default

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.H.4	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1180.01	SKINNY-DRUM

MANAGEMENT STRATEGIES

THE OBJECTIVE OF THIS PROJECT IS TO COMPLETE THE REHABILITATION OF THE HIGH VALUE BRIDGE #316 OVER I-40/I-440 ON SR 2542 (ROCK QUARRY RD) USING A SERIES OF NIGHT TIME LANE CLOSURES AS REQUIRED.

THE CONTRACTOR WILL ESTABLISH A PLAN OF ACTION / SEQUENCE OF CONSTRUCTION TO COMPLETE THE REHABILITATION AND UTILIZE THE PROVIDED LANE CLOSURES AS DESIRED.
NOTE: THE TIME RESTRICTIONS MAY VARY WITH EACH LANE CLOSURE.

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING
- PROPOSED
- TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

STEWART

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www.stewartinc.com

APPROVED: DocuSigned by: David Ruggles C46276BDF412422...

DATE: 6/12/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TRANSPORTATION MANAGEMENT PLAN

ROADWAY STANDARD DRAWINGS, LEGEND, & MANAGEMENT STRATEGIES

5/9/2018
...\002_RockQuarry_TITLE02.dgn
USER:default

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.H.4	TMP-1B

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
I-40 -CLOSE ONE LANE	5:00 A.M. - 9:00 P.M. MONDAY THRU FRIDAY 6:00 A.M. - 11:00 P.M. SATURDAY THRU SUNDAY

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME

I-40

HOLIDAY

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 5:00 A.M. DECEMBER 31ST TO 9:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 9:00 P.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 5:00 A.M. THURSDAY AND 9:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 5:00 A.M. FRIDAY TO 9:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 5:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 5:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 5:00 A.M. FRIDAY AND 9:00 P.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 5:00 A.M. TUESDAY TO 9:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 5:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

LANE AND SHOULDER CLOSURE REQUIREMENTS

C) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

G) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

TRAFFIC PATTERN ALTERATIONS

H) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

I) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

K) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 200 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

L) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

M) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

MISCELLANEOUS

N) LAW ENFORCEMENT MAY BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.

PHASING

NOTES

RETURN TRAFFIC TO THE CURRENT TRAFFIC PATTERN AT THE END OF EACH WORK PERIOD UNLESS OTHERWISE NOTED IN THE PHASING OR AS DIRECTED BY THE ENGINEER.

THE TERM RSD DENOTES "ROADWAY STANDARD DRAWING".

PHASE I

STEP 1: PERFORM BENT REPAIRS AT BENT 1 AND BENT 3 AS SHOWN ON STRUCTURE DRAWINGS. USE RSD 1101.04 TO CLOSE SHOULDERS OF I-40 AS REQUIRED.
STEP 2: PLACE "BUMP" SIGN ON NORTHBOUND ROCK QUARRY APPROACH TO SPAN D AS NECESSARY AFTER SPAN D GIRDERS HAVE BEEN JACKED. LEAVE "BUMP" SIGN IN PLACE UNTIL GIRDERS HAVE BEEN UNJACKED.
STEP 3: PLACE "BUMP" SIGN ON SOUTHBOUND ROCK QUARRY APPROACH TO SPAN A AS NECESSARY AFTER SPAN A GIRDERS HAVE BEEN JACKED. LEAVE "BUMP" SIGN IN PLACE UNTIL GIRDERS HAVE BEEN UNJACKED.

PHASE II

STEP 1: USING RSD 1101.02, SHEET 4 OF 14, CLOSE MEDIAN LANE OF EASTBOUND I-40 AND MEDIAN LANE OF WESTBOUND I-40.
STEP 2: PERFORM REPAIRS TO BENT 2 AND GIRDER PAINTING AS REQUIRED
STEP 3: OPEN I-40 EASTBOUND AND WESTBOUND LANES TO TRAFFIC
STEP 4: REPEAT STEPS 1 THRU 3 ON SUBSEQUENT NIGHTS AS REQUIRED.

STEWART
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421 Fayetteville St,
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www.stewartinc.com

APPROVED: DocuSigned by: David Ruggles C462768DF412422...
DATE: 6/12/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

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TRANSPORTATION MANAGEMENT PLAN

GENERAL NOTES & PHASING

SCOPE OF WORK

-REPLACE SPAN A BEARINGS AT BENT 1 AND SPAN D BEARINGS AT BENT 3

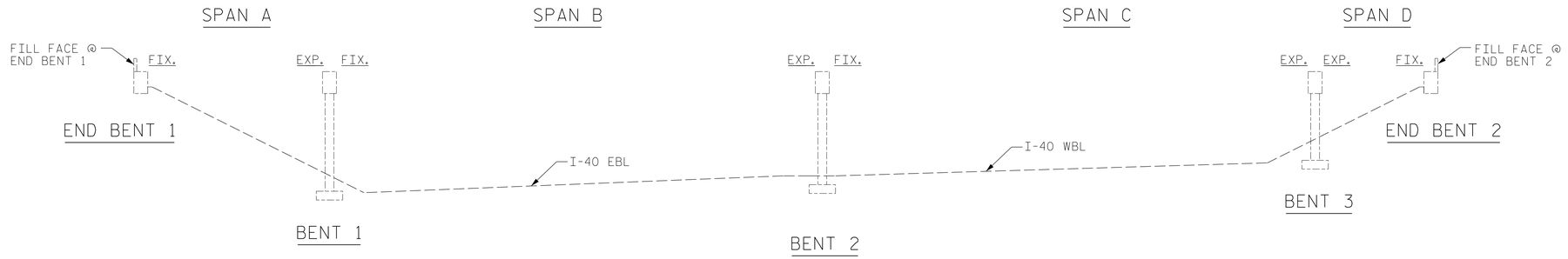
-JACK SPAN A AND SPAN D AND DEMOLISH EXISTING BENT PEDESTALS AT SPAN A AND SPAN D

-CONSTRUCT NEW PEDESTALS AT SPAN A AND SPAN D

-SUBSTRUCTURE REPAIRS USING EPOXY RESIN INJECTION AND SHOTCRETE

-EPOXY COATING OF TOP OF CAPS

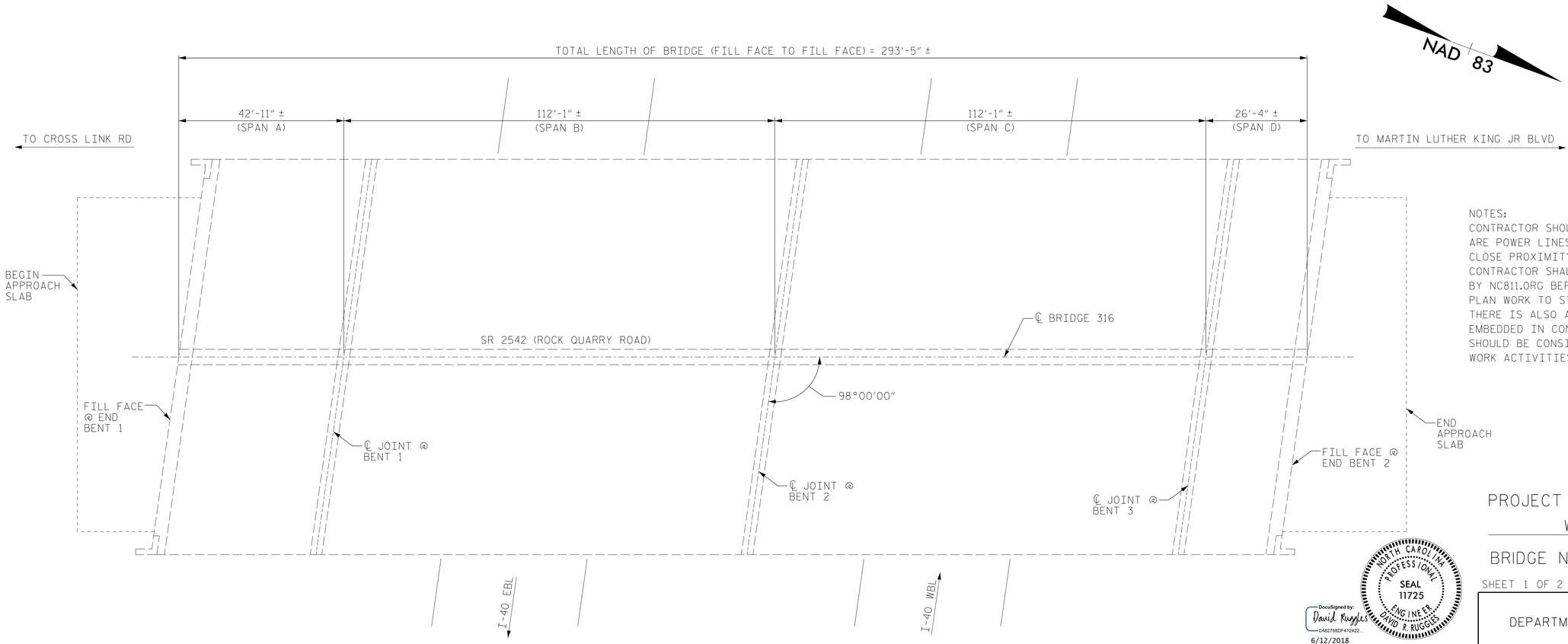
-PAINTING ENDS OF EXISTING WEATHERING STEEL GIRDERS



ELEVATION

I hereby certify that this structure was rehabilitated according to these plans or as noted therein.

Resident Engineer Date



PLAN

NAD 83

NOTES:
CONTRACTOR SHOULD BE AWARE THAT THERE ARE POWER LINES AND OTHER UTILITIES IN CLOSE PROXIMITY TO THE BRIDGE. CONTRACTOR SHALL HAVE UTILITIES MARKED BY NC811.ORG BEFORE BEGINNING WORK AND PLAN WORK TO STAY WELL CLEAR OF UTILITIES. THERE IS ALSO AN ELECTRICAL CONDUIT EMBEDDED IN CONCRETE BARRIER THAT SHOULD BE CONSIDERED WHEN PLANNING WORK ACTIVITIES.

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DocuSigned by: David Ruggles C4627768DF412422...

6/12/2018

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PROJECT NO. 17BP.5.H.4

WAKE COUNTY

BRIDGE NO. 316

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER I-40 ON SR 2542 (ROCK QUARRY RD) BETWEEN CROSS LINK RD AND MARTIN LUTHER KING JR BLVD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			16

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DRAWN BY: E. PHELPS DATE : 06-17
CHECKED BY: D. RUGGLES DATE : 09-17
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 09-17

6/12/2018
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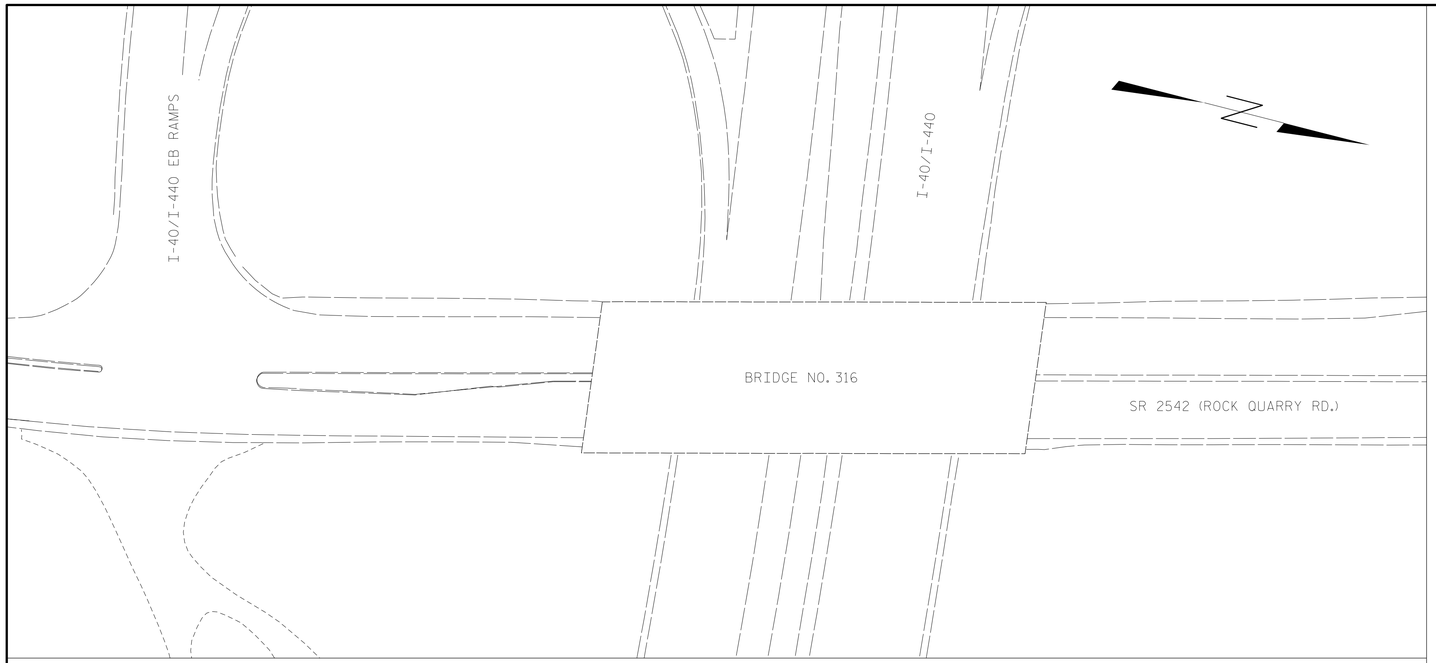
WAKE 316



LOCATION SKETCH

NOTES:

INFORMATION INDICATED ON THE GENERAL DRAWING AND LOCATION SKETCH SHALL BE CONSIDERED GENERAL INFORMATION, ONLY. CONTRACTOR SHALL CONFIRM, THROUGH OTHER SOURCES, SPECIFIC INFORMATION REGARDING THE BRIDGES, ROADWAY, UTILITIES, THE SURROUNDING AREA, AND ANY OTHER ASPECTS THAT MAY BE NECESSARY TO PERFORM AND COMPLETE THE PROJECT.

EXISTING DIMENSIONS AND BRIDGE CONDITIONS ARE FROM BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

WORK ON BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE TO ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

FOR CONTROL OF TRAFFIC, SEE TRANSPORTATION MANAGEMENT PLAN.

ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING AT BENTS 1 AND 3, SEE SPECIAL PROVISIONS.

FOR CAP DEMOLITION AT BENTS 1 & 3, SEE SPECIAL PROVISIONS.

FOR SEQUENCE OF WORK, SEE SPECIAL PROVISIONS.

SPAN A, SPAN B, SPAN C, AND SPAN D ENDS OF GIRDERS 1 THRU 13 AT BENTS 1 THRU 3 SHALL BE PAINTED IN ACCORDANCE WITH SECTION 442-12 OF THE STANDARD SPECIFICATIONS AND ANY OTHER APPLICABLE SECTIONS. GIRDER ENDS SHALL BE PAINTED FOR A MINIMUM OF 1.5 TIMES THE GIRDER DEPTH. GIRDER ENDS AT END BENTS 1 AND 2 WILL NOT BE PAINTED.

TOTAL BILL OF MATERIAL

	CLASS A CONCRETE	REINFORCING STEEL	CLEANING AND PAINTING EXISTING WEATHERING STEEL FOR BRIDGE #316	POLLUTION CONTROL	PAINTING CONTAINMENT FOR BRIDGE #316	ELASTOMERIC BEARINGS	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	BRIDGE JACKING AT BENTS 1 & 3	CAP DEMOLITION AT BENTS 1 & 3	EPOXY COATING
	CU. YDS.	LBS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	CU. FT.	LIN. FT.	LUMP SUM	LUMP SUM	SQ. FT.
BRIDGE 316	5.8	1,656	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	200.0	125.0	LUMP SUM	LUMP SUM	250
TOTAL	5.8	1,656	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	200.0	125.0	LUMP SUM	LUMP SUM	250

CLEANING AND PAINTING OF GIRDER SEQUENCE:

CLEAN AND PAINT GIRDERS IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS FOR PAINTING EXISTING WEATHERING STEEL STRUCTURE.

DURING ALL CLEANING AND PAINTING OPERATIONS, THE CONTRACTOR SHALL ISOLATE THE WORK AREA WITH APPROPRIATE CONTAINMENT DEVICES IN ORDER TO PREVENT ANY GENERATED DEBRIS FROM CAUSING VIOLATIONS OF CURRENT FEDERAL, STATE AND LOCAL AIR AND WATER POLLUTION REGULATIONS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LEGAL DISPOSAL OF ALL DEBRIS COLLECTED BY THE CONTAINMENT DEVICES.

DRAWN BY: E. PHELPS DATE: 06-17
CHECKED BY: D. RUGGLES DATE: 09-17
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 09-17

DocuSigned by: David Ruggles C462768DF412422...
6/26/2018

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

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STEWART

PROJECT NO. 17BP.5.H.4
WAKE COUNTY
BRIDGE NO. 316
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER I-40
ON SR 2542 (ROCK QUARRY RD)
BETWEEN CROSS LINK RD AND
MARTIN LUTHER KING JR BLVD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			16

WAKE 316
$$$SYSTIME$$$
$$$DGN$$$
$$$USERNAME$$$

BENT REPAIR STAGING SEQUENCE

STAGING SEQUENCE BELOW IS FOR BENT 1. BENT 3 STAGING SEQUENCE IS SIMILAR.
PEDESTAL REFERS TO RAISED PORTION OF BRIDGE SEAT ON SPAN A OR SPAN D SIDE OF BENT.

STEP 1:
- REMOVE PORTIONS OF PEDESTALS BETWEEN GIRDERS AS SHOWN. A FOUR FT WIDE PORTION OF PEDESTAL BENEATH EACH SPAN A GIRDER SHALL REMAIN.
- PEDESTAL SHALL BE REMOVED TO ELEVATION THAT MATCHES ADJACENT SPAN B SEAT.

STEP 2:
- INSTALL JACKING SADDLES AS SHOWN BENEATH GIRDERS 2 THRU 12.

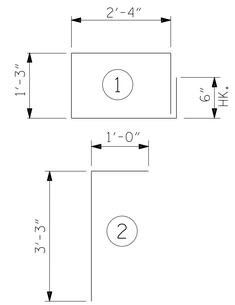
STEP 3:
- REMOVE NUTS FROM SPAN A BEARING ANCHOR BOLTS FOR GIRDERS 1 THRU 13.
- INSTALL SHIMS BETWEEN JACKING SADDLES AND SPAN B BOTTOM OF GIRDERS FOR GIRDERS 2 THRU 12 AND LOW PROFILE JACKS BENEATH GIRDERS 1 AND 13.
- INSTALL JACKS (AND SHIMS AS REQUIRED) BETWEEN JACKING SADDLES AND SPAN A BOTTOM OF GIRDERS FOR GIRDERS 1 THRU 13.
- SURVEYOR TO MEASURE BOTTOM OF GIRDER ELEVATIONS FOR SPAN A GIRDERS 1 THRU 13 AT BEARINGS.
- JACK SPAN A GIRDERS 1 THRU 13 UPWARD AT AN EQUAL RATE AS DESCRIBED ON SHEET S-15 FOR A MAXIMUM DISTANCE OF 1/4 INCH.
- SURVEYOR TO RE-MEASURE BOTTOM OF GIRDER ELEVATIONS FOR SPAN A GIRDERS 1 THRU 13 IN JACKED POSITION AT BEARINGS.

STEP 4:
- SEVER EXISTING ANCHOR BOLTS FOR GIRDERS 1 THRU 13. REMOVE BEARINGS FOR GIRDERS 1 THRU 13.
- REMOVE PEDESTALS FOR GIRDERS 2 THRU 12 TO ELEVATION THAT MATCHES ADJACENT SPAN B SEAT.

STEP 5:
- LOCATE MAIN CAP REINFORCEMENT IN CAP (SEE NOTES).
- PLACE MARK ON CAP AT HOLE LOCATIONS FOR GIRDERS 1 AND 13. DRILL 2½" Ø HOLES IN CAP AT GIRDERS 1 AND 13. HOLES SHALL BE DRILLED 1'-3" DEEP TO MATCH ANCHOR BOLT EMBEDMENT. INSTALL ANCHOR BOLTS USING ADHESIVE ANCHORS AFTER BEARING PLATE P2 AND ELASTOMERIC PAD HAVE BEEN PLACED.
- DRILL HOLES IN CAP FOR #6 "B" BARS IN AREAS AWAY FROM MAIN CAP REINFORCEMENT. INSTALL #6 "B" BARS USING ADHESIVE ANCHORS. TEST ANCHORS USING LEVEL I FIELD TESTING AS DESCRIBED IN SPECIFICATIONS. INSTALL REMAINING SEAT REINFORCEMENT.
- PLACE FORMING FOR NEW BRIDGE PEDESTALS. TOP OF FORM ELEVATION TO BE ESTABLISHED BY MEASURING GAP BETWEEN BOTTOM OF SPAN A GIRDERS AND TOP OF FORM. GAP SHALL BE TOTAL BEARING DEPTH PLUS JACKING DEPTH (JACKING DEPTH IS DIFFERENCE BETWEEN BOTTOM OF JACKED GIRDER ELEVATION AND BOTTOM OF UNJACKED GIRDER ELEVATION).
- POUR CONCRETE FOR NEW PEDESTALS.

STEP 6:
- AFTER CONCRETE HAS SET, REMOVE FORMS AND INSTALL NEW BEARINGS FOR SPAN A GIRDERS 2 THRU 12.
- AFTER CONCRETE HAS REACHED FULL STRENGTH, UNJACK GIRDERS TO REST ON NEW BEARINGS (AND ON EXISTING BEARINGS FOR GIRDERS 1 AND 13). REMOVE JACKS AND SADDLES.
- PORTIONS OF SPAN A BRIDGE SEAT BETWEEN SADDLES TO BE GROUND TO A SMOOTH SURFACE.
- INSTALL GROUT IN BEARING GROUT CANS. AFTER GROUT HAS SET, TIGHTEN NUTS ON ANCHOR BOLTS FOR GIRDERS 1 THRU 13.
- INSTALL EPOXY PROTECTIVE COATING ON CAP.
- PAINT ENDS OF BEAMS AS DESCRIBED IN PLAN NOTES AND SPECIFICATIONS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT #1 REPAIRS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B11	66	#6	STR	3'-3"	322
B12	44	#6	2	4'-3"	281
S1	44	#4	1	7'-8"	225

REINFORCING STEEL (FOR BENT No. 1) 828 LBS.

CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 1)

POUR #1 PEDESTALS	2.9 C.Y.
TOTAL CLASS A CONCRETE	2.9 C.Y.
1¾" Ø x 1'-8½" ANCHOR BOLTS	NO: 22
PIPE SYSTEM FOR ANCHOR BOLTS	NO: 22

BILL OF MATERIAL
BENT #3 REPAIRS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B11	66	#6	STR	3'-3"	322
B12	44	#6	2	4'-3"	281
S1	44	#4	1	7'-8"	225

REINFORCING STEEL (FOR BENT No. 3) 828 LBS.

CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 3)

POUR #1 PEDESTALS	2.9 C.Y.
TOTAL CLASS A CONCRETE	2.9 C.Y.
1¾" Ø x 1'-8½" ANCHOR BOLTS	NO: 22
PIPE SYSTEM FOR ANCHOR BOLTS	NO: 22

NOTES

CONTRACTOR TO UTILIZE X-RAY IMAGERY OR PACHOMETER TO LOCATE EXISTING CAP REINFORCEMENT BEFORE DRILLING HOLES FOR NEW PEDESTAL DOWELS. CONTRACTOR MAY UTILIZE LIGHTWEIGHT PNEUMATIC HAMMER (17 LB. MAXIMUM) WITH POINTS THAT DO NOT EXCEED WIDTH OF SHANK (OR HAND PICKS AND CHISELS) TO DEMO CAP CONCRETE AS NECESSARY TO LOCATE EXISTING CAP REINFORCEMENT. ALTERNATIVELY, HYDRO-DEMOLITION METHODS MAY BE UTILIZED TO DEMO CAP CONCRETE AS NECESSARY. THE METHOD UTILIZED SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL AND SHALL NOT DAMAGE CAP REINFORCEMENT OR DAMAGE CAP CONCRETE ANY MORE THAN NECESSARY TO LOCATE EXISTING REINFORCEMENT.

PROJECT NO. 17BP.5.H.4

WAKE COUNTY

BRIDGE NO. 316

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

DocuSigned by: David Ruggles C462768DF412422...
6/12/2018

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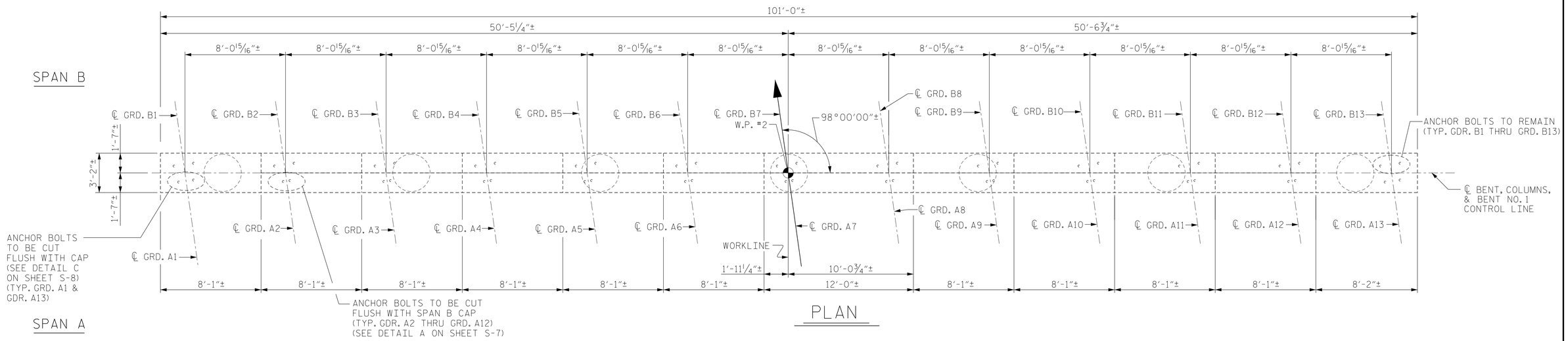
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS 1 & 3
STAGING & BOM

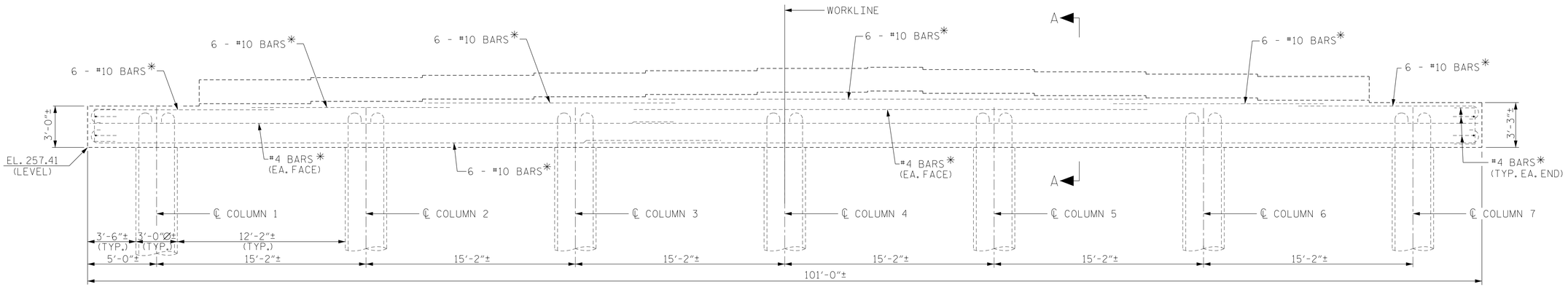
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			16

DRAWN BY: E. PHELPS DATE : 06-17
CHECKED BY: D. RUGGLES DATE : 09-17
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 09-17

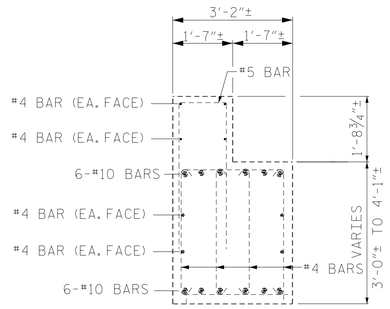
5/9/2018
...\012_RockQuarryRehab_Sequencing&BOM.dgn
USER:ephelps
WAKE 316



PLAN



ELEVATION



SECTION A-A

(COLUMN AND COLUMN STEEL NOT SHOWN FOR CLARITY)
(PEDESTAL REINFORCEMENT MAY NOT EXIST)

✳BAR SIZE AND NUMBER ARE AS SHOWN ON CONSTRUCTION PLANS.
(IT IS ASSUMED THAT AS-BUILT CONDITION MATCHES CONSTRUCTION PLANS)

EXISTING CONDITIONS - BENT 1

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CHECKED BY: D. RUGGLES DATE: 09-17
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 09-17

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PROJECT NO. 17BP.5.H.4
WAKE COUNTY
BRIDGE NO. 316
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
EXISTING CONDITIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			16

WAKE 316
5/9/2018
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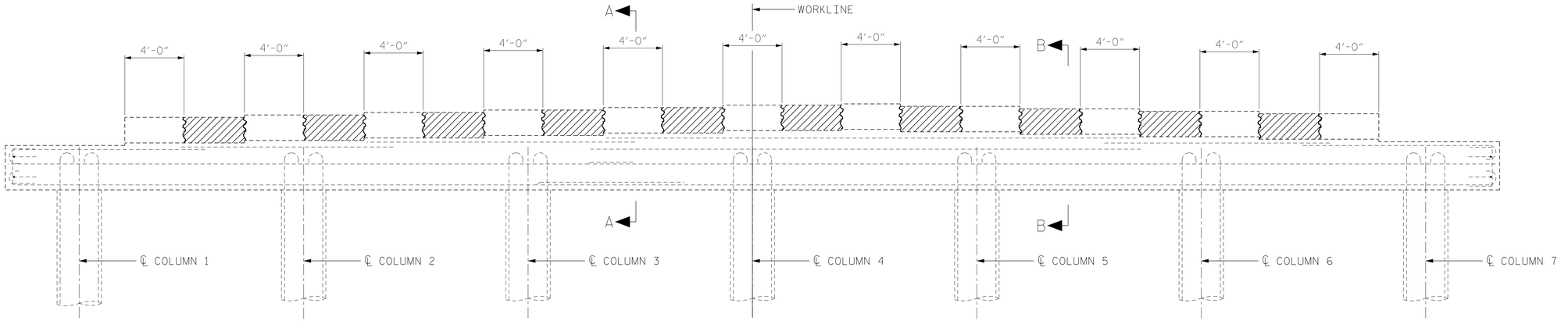
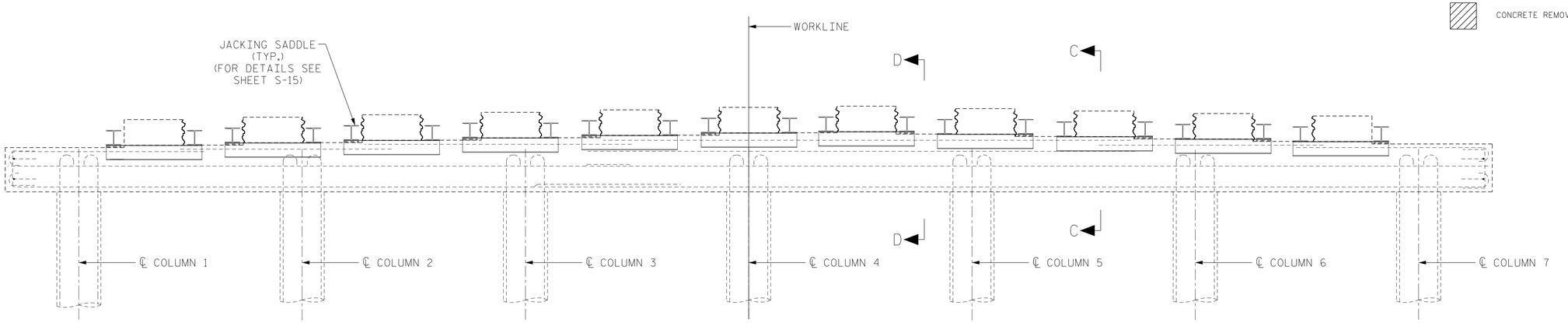


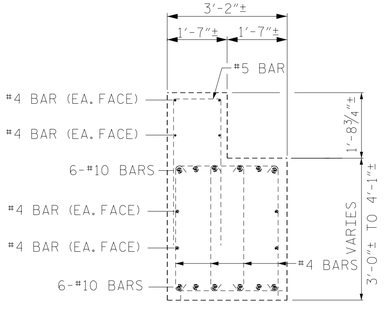
STEP 1



LEGEND

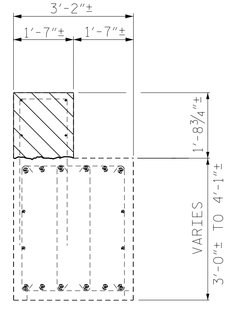
CONCRETE REMOVAL

STEP 2



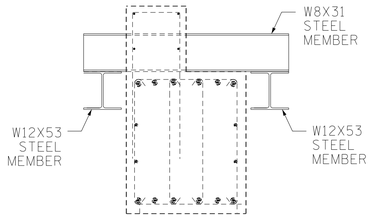
SECTION A-A

(COLUMN AND COLUMN STEEL NOT SHOWN FOR CLARITY)
(PEDESTAL REINFORCEMENT MAY NOT EXIST)



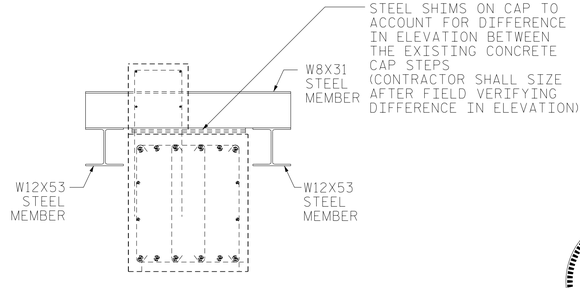
SECTION B-B

(COLUMN AND COLUMN STEEL NOT SHOWN FOR CLARITY)



SECTION C-C

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15



SECTION D-D

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15

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PROJECT NO. 17BP.5.H.4
WAKE COUNTY
BRIDGE NO. 316
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
CONSTRUCTION STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16

WAKE 316
5/9/2018
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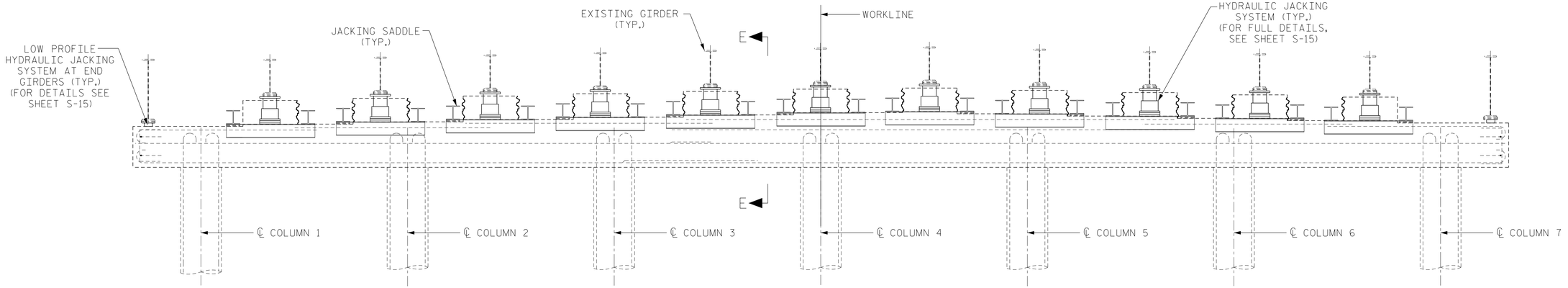
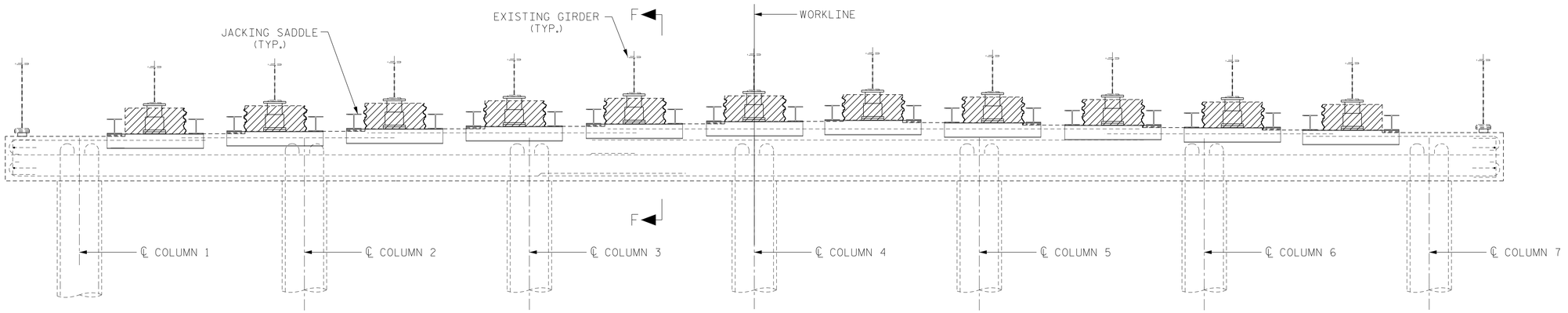
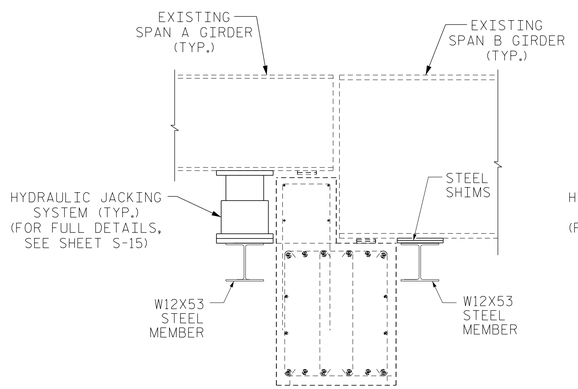


STEP 3

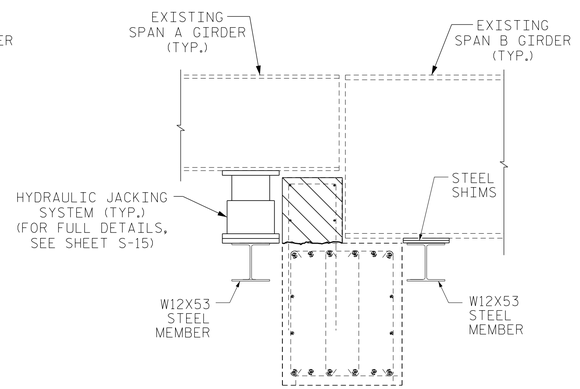


STEP 4



SECTION E-E

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15



SECTION F-F

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15

LEGEND

CONCRETE REMOVAL

PROJECT NO. 17BP.5.H.4

WAKE COUNTY

BRIDGE NO. 316

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

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SUBSTRUCTURE

BENT 1

CONSTRUCTION STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			16

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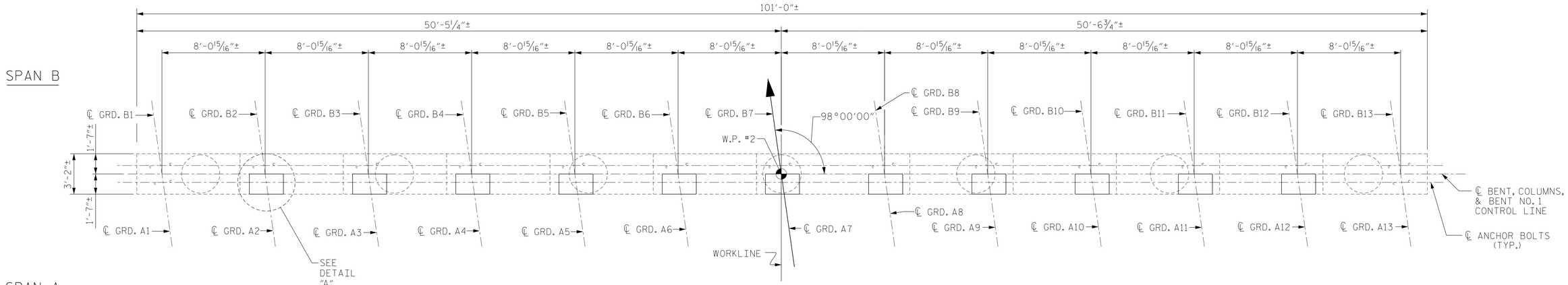
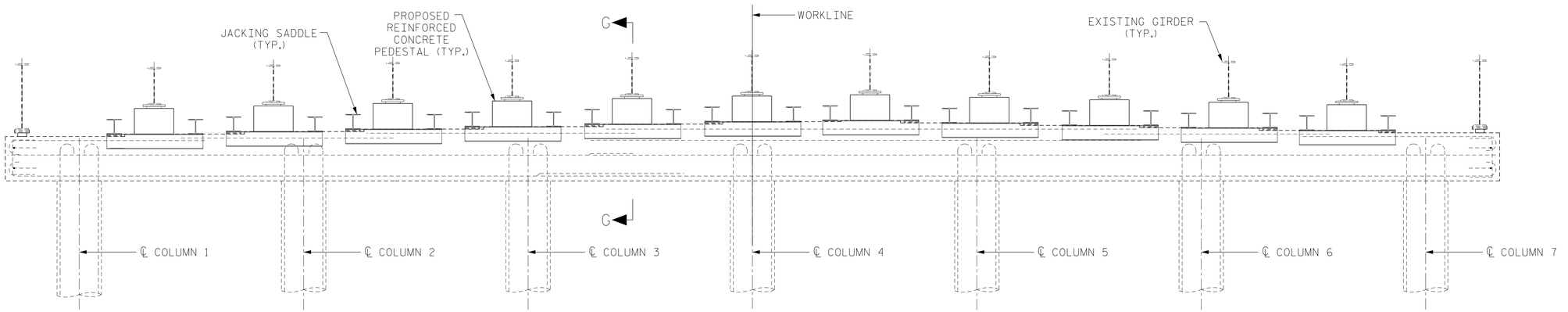


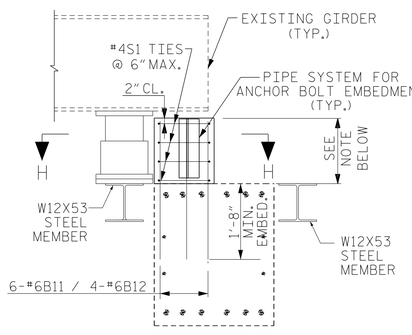
STEP 5 - PLAN

NOTE: JACKING SADDLE AND HYDRAULIC JACKING SYSTEM NOT SHOWN FOR CLARITY



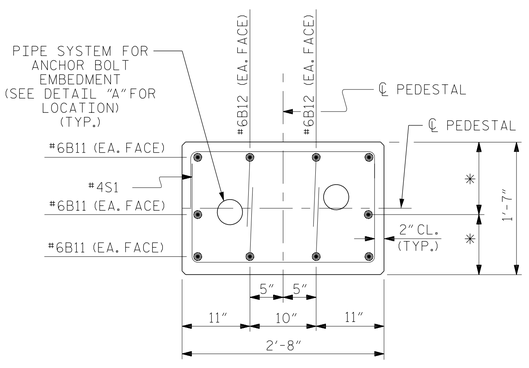
STEP 5 - ELEVATION

HYDRAULIC JACKING SYSTEM BEHIND PROPOSED PEDESTAL NOT SHOWN FOR CLARITY



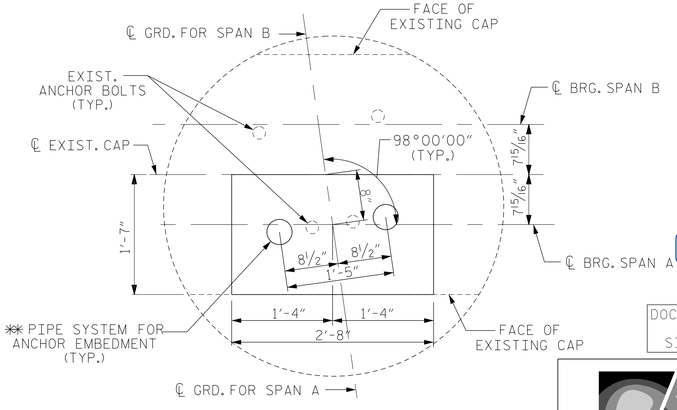
SECTION G-G

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
CONTRACTOR TO ESTABLISH HEIGHT. SEE STAGING NOTES.
APPROXIMATE HEIGHT IS 1'-8¼"±



SECTION H-H

TYPICAL FOR ALL PEDESTALS
* POSITION BARS TO AVOID EXISTING LONGITUDINAL REINFORCEMENT IN EXISTING CAP



DETAIL "A"

TYPICAL FOR ALL PEDESTALS
** FOR DETAILS SEE "PIPE SYSTEM DETAIL" ON SHEET S-14

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PROJECT NO. 17BP.5.H.4
WAKE COUNTY
BRIDGE NO. 316
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
CONSTRUCTION STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			16

WAKE 316
5/9/2018
...\016_RockQuarryRehab_Bent1(4of5).dgn
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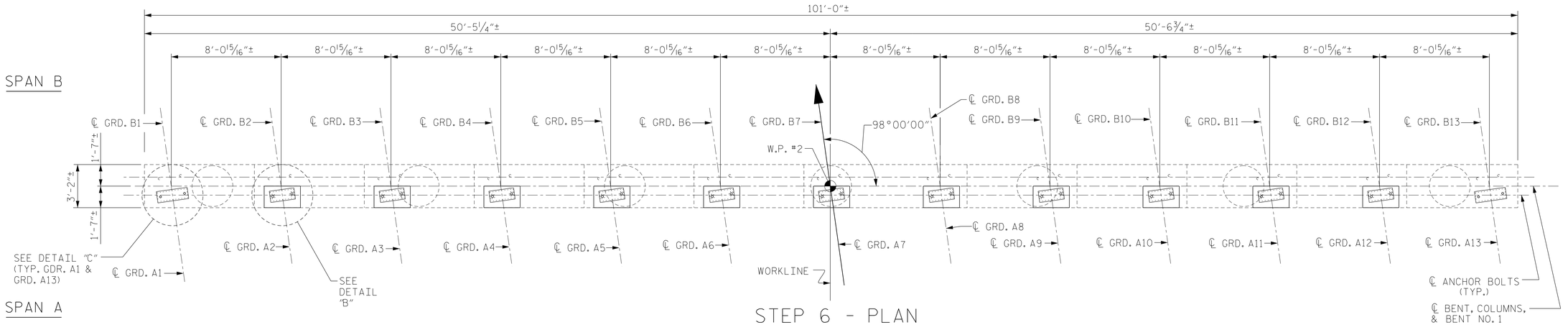
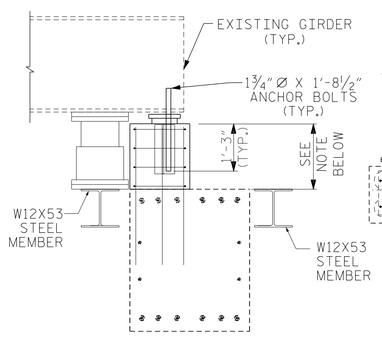


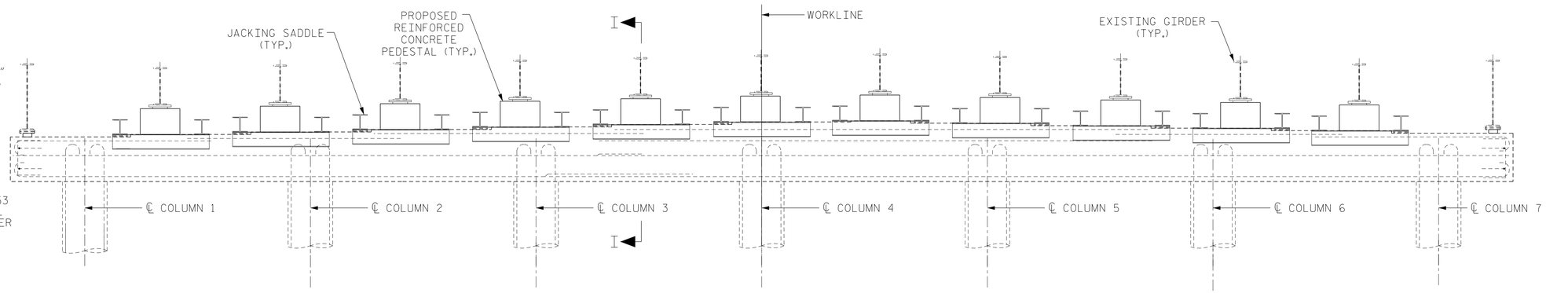
STEP 6 - PLAN

NOTE: JACKING SADDLE AND HYDRAULIC JACKING SYSTEM NOT SHOWN FOR CLARITY
FOR TYPICAL BENT CAP EPOXY COATING LIMTS, SEE DETAIL "D".



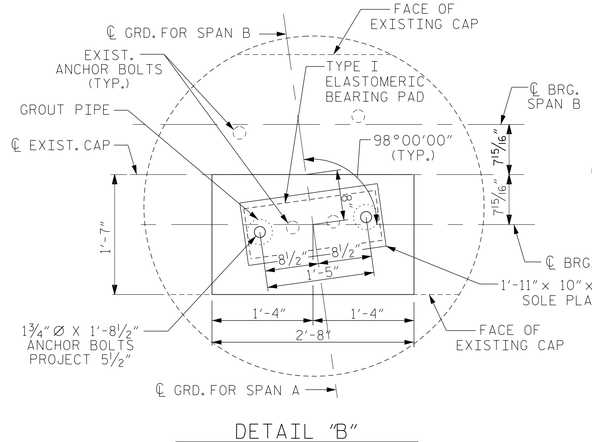
SECTION I-I

FOR DIMENSION AND REINFORCEMENT IN PEDESTAL, SEE SECTION G-G
CONTRACTOR TO ESTABLISH HEIGHT. SEE STAGING NOTES.
APPROXIMATE HEIGHT IS 1'-8¼"±



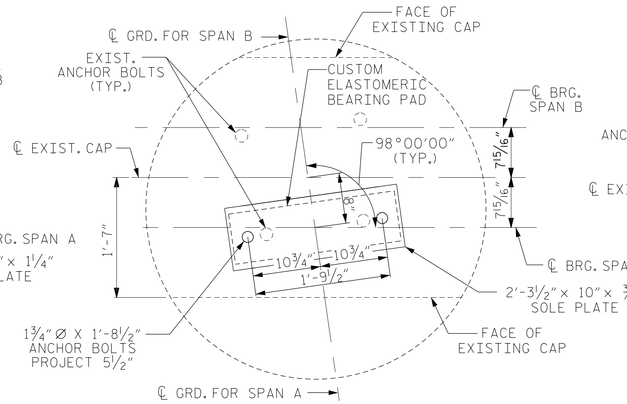
STEP 6 - ELEVATION

HYDRAULIC JACKING SYSTEM BEHIND PROPOSED PEDESTAL NOT SHOWN FOR CLARITY



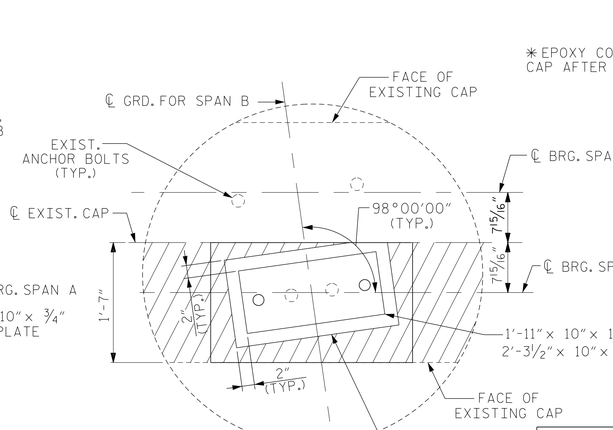
DETAIL "B"

TYPICAL FOR ALL PEDESTALS



DETAIL "C"

TYPICAL FOR EXTERIOR GIRDERS
ADHESIVE ANCHOR TO BE INSTALLED THROUGH HOLES IN BEARING PLATES.
CONTRACTOR SHALL ENSURE THAT HOLES ARE CLEAN AND SHALL INSTALL ANCHORS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



DETAIL "D"

*EPOXY COAT ALL HORIZONTAL SURFACES OF CAP AFTER BEARINGS HAVE BEEN INSTALLED.

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

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6/12/2018

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CHECKED BY:	D. RUGGLES
DESIGN ENGINEER OF RECORD:	D. RUGGLES
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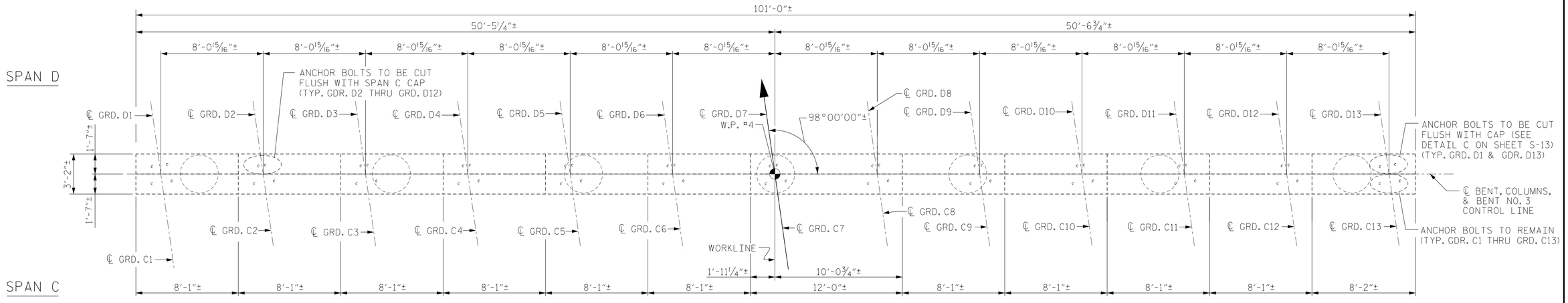
PROJECT NO. 17BP.5.H.4
WAKE COUNTY
BRIDGE NO. 316
SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

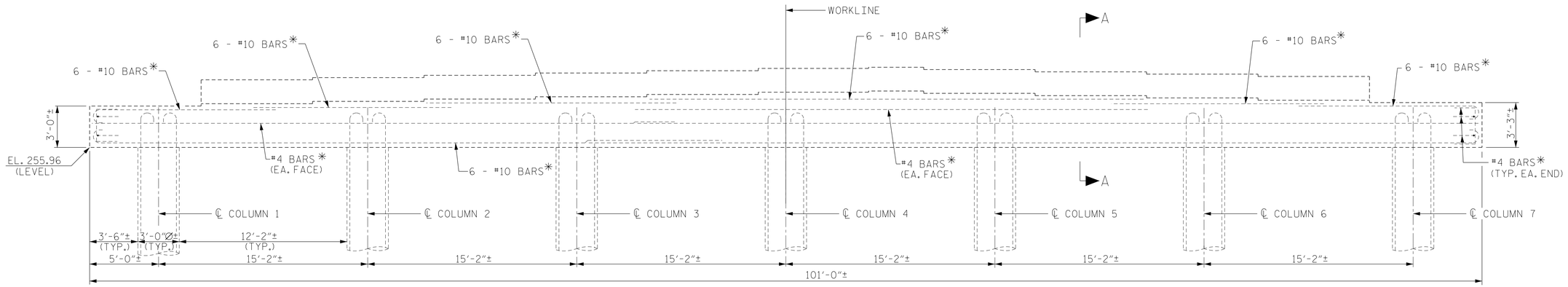
SUBSTRUCTURE
BENT 1
CONSTRUCTION STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			16

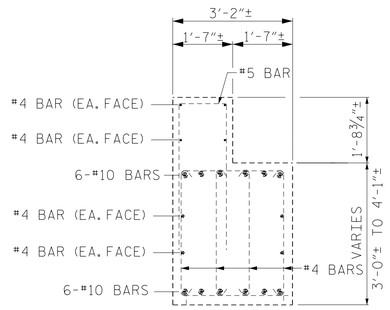
WAKE 316
5/9/2018
...\017_RockQuarryRehab_Bent1(5of5).dgn
USER:ephelps



PLAN



ELEVATION



SECTION A-A

(COLUMN AND COLUMN STEEL NOT SHOWN FOR CLARITY)
(PEDESTAL REINFORCEMENT MAY NOT EXIST)

✳BAR SIZE AND NUMBER ARE AS SHOWN ON CONSTRUCTION PLANS.
(IT IS ASSUMED THAT AS-BUILT CONDITION MATCHES CONSTRUCTION PLANS)

EXISTING CONDITIONS - BENT 3

DRAWN BY: E. PHELPS DATE: 06-17
CHECKED BY: D. RUGGLES DATE: 09-17
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 09-17

PROJECT NO. 17BP.5.H.4
WAKE COUNTY
BRIDGE NO. 316
SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES
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SUBSTRUCTURE
BENT 3
EXISTING CONDITIONS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			16

WAKE 316
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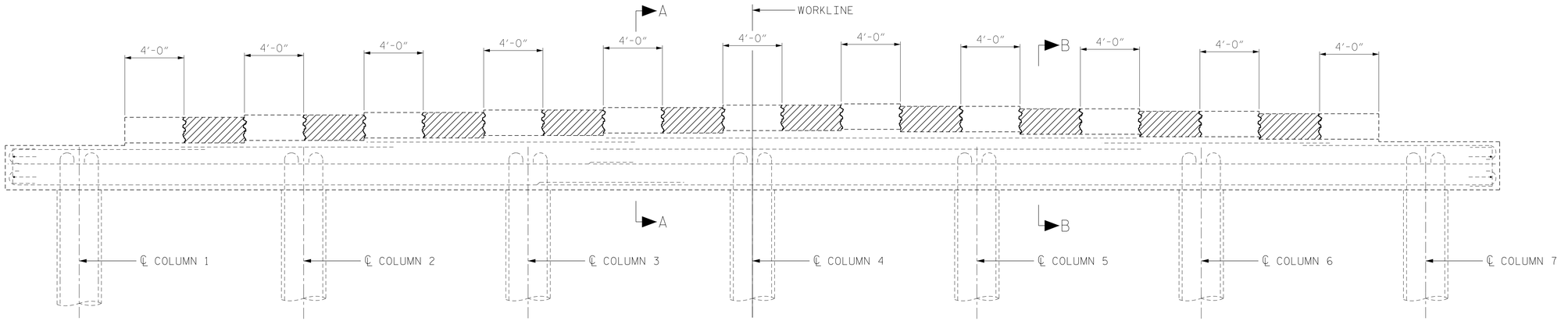
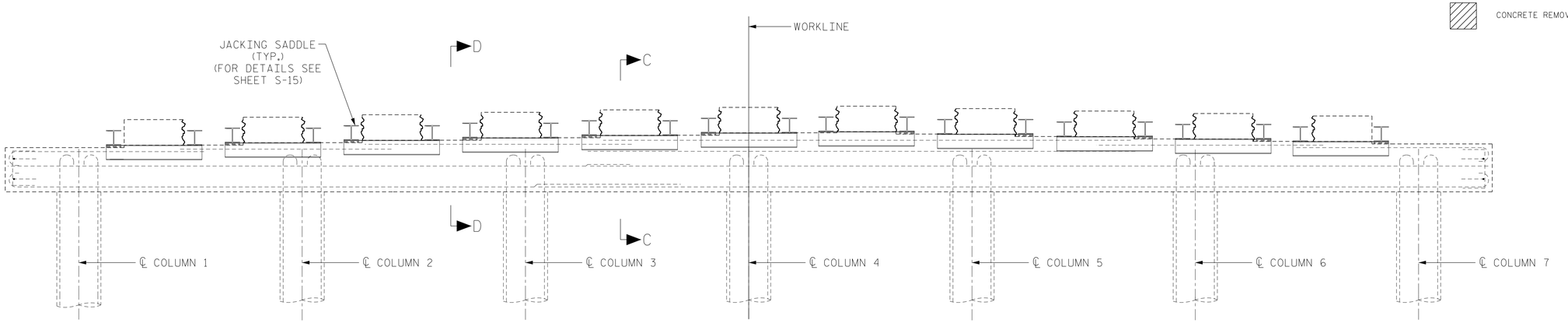


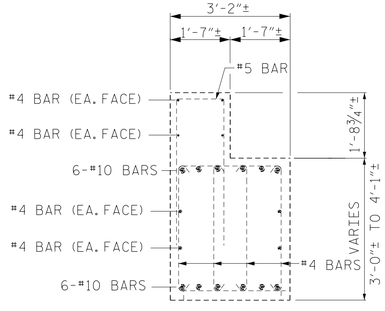
STEP 1

LEGEND

CONCRETE REMOVAL

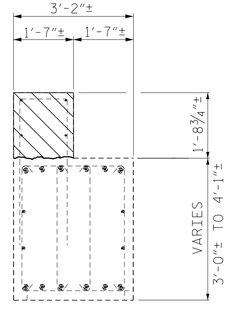


STEP 2



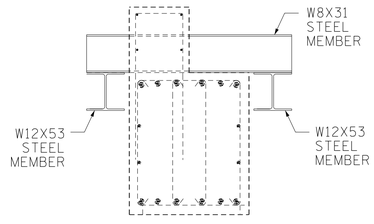
SECTION A-A

(COLUMN AND COLUMN STEEL NOT SHOWN FOR CLARITY)
(PEDESTAL REINFORCEMENT MAY NOT EXIST)



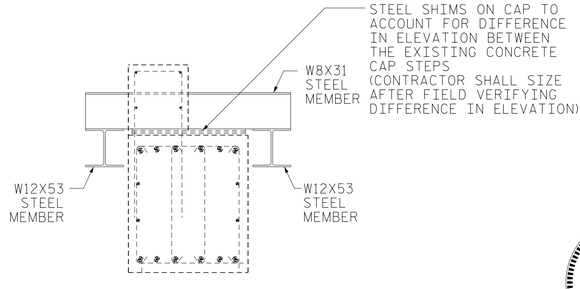
SECTION B-B

(COLUMN AND COLUMN STEEL NOT SHOWN FOR CLARITY)



SECTION C-C

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15



SECTION D-D

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15

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SHEET 2 OF 5

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE
BENT 3
CONSTRUCTION STAGING

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2			4			16

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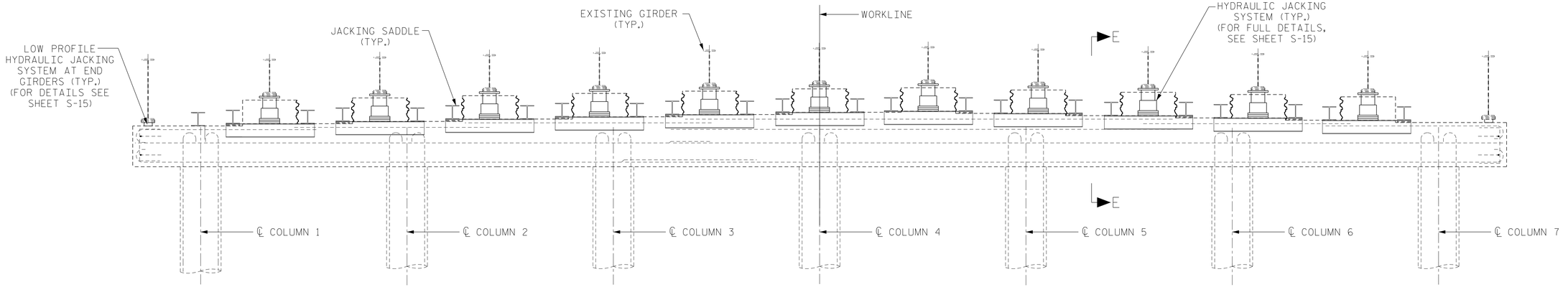
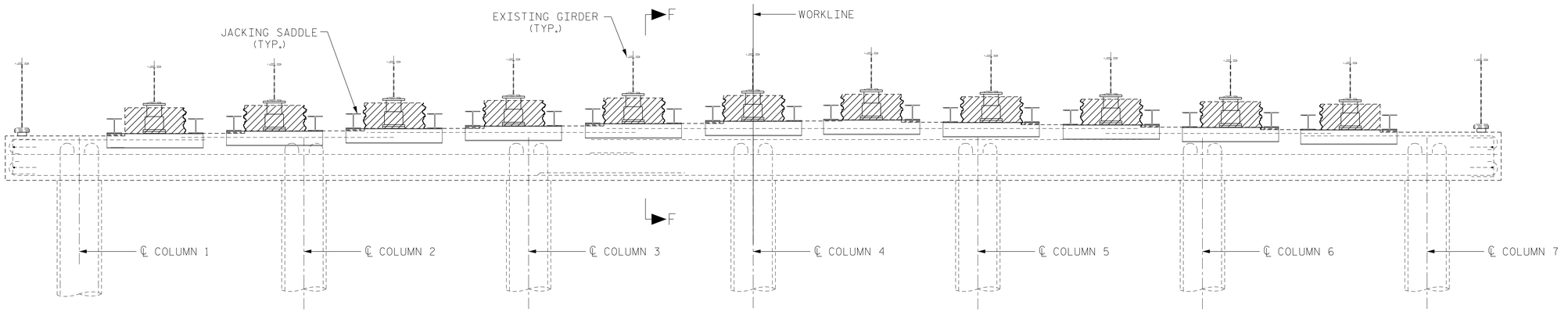
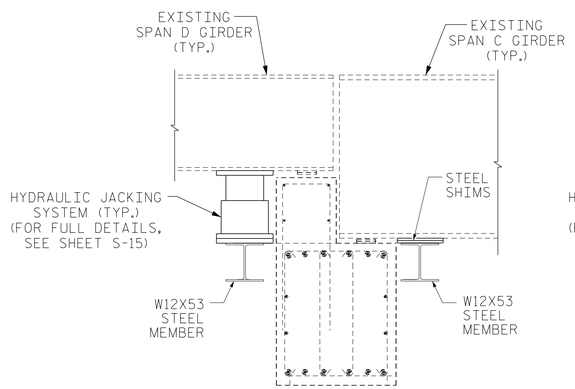


STEP 3

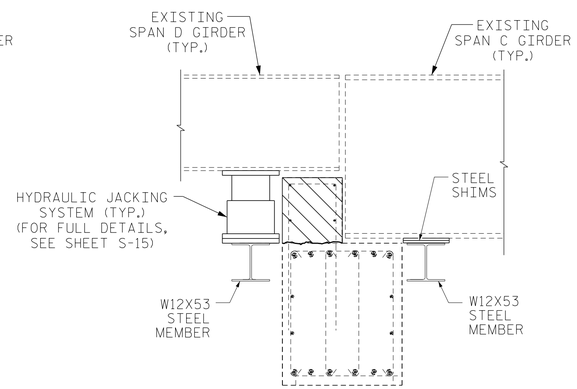


STEP 4



SECTION E-E

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15



SECTION F-F

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
FOR FULL JACKING SADDLE DETAILS, SEE SHEET S-15

LEGEND

CONCRETE REMOVAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

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SUBSTRUCTURE
BENT 3
CONSTRUCTION STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
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2			4			16

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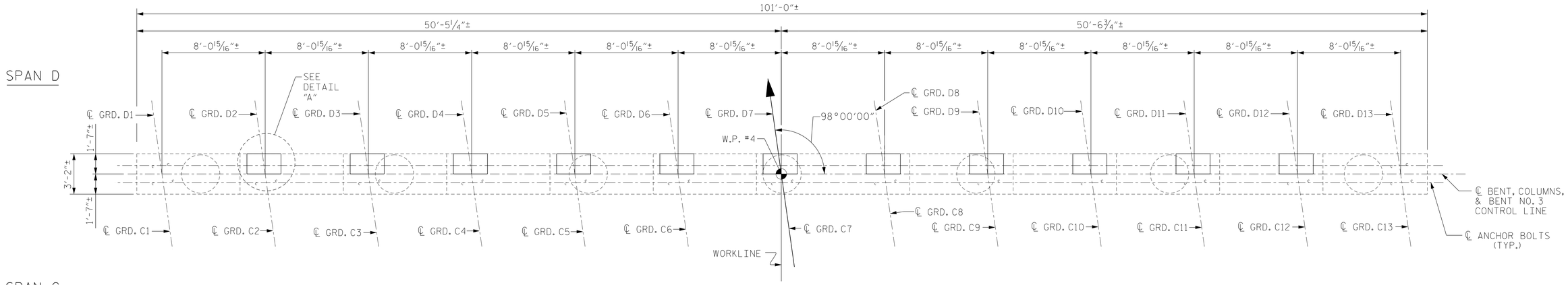
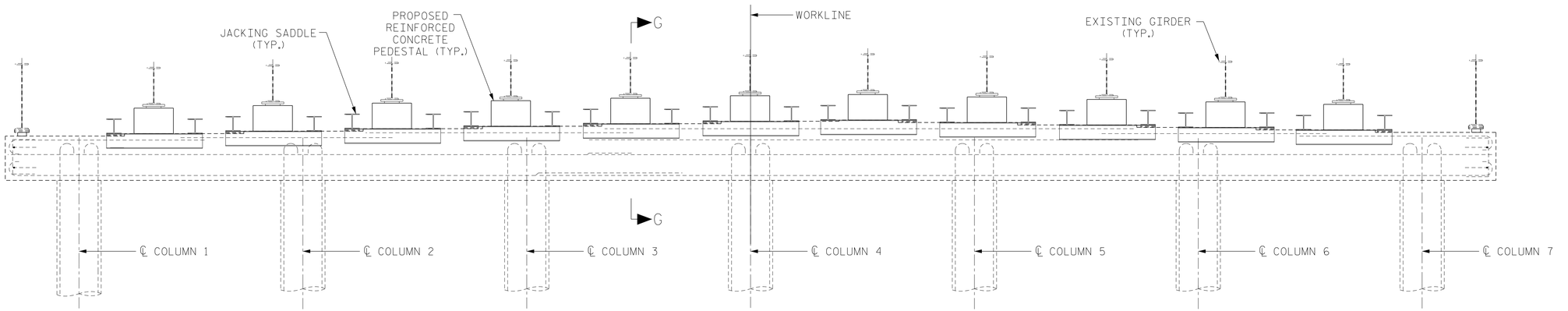


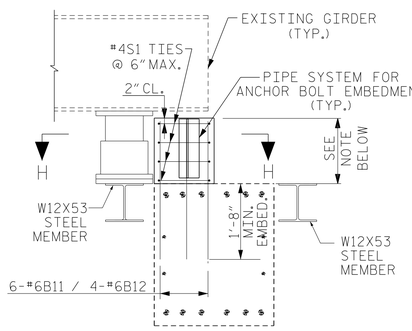
STEP 5 - PLAN

NOTE: JACKING SADDLE AND HYDRAULIC JACKING SYSTEM NOT SHOWN FOR CLARITY



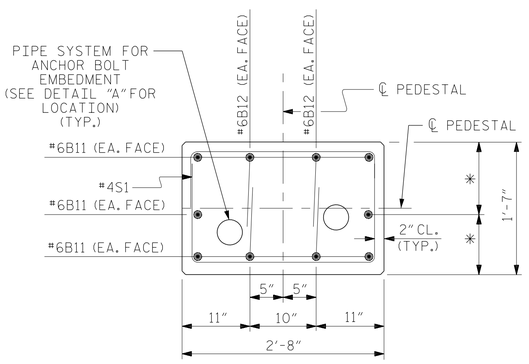
STEP 5 - ELEVATION

HYDRAULIC JACKING SYSTEM BEHIND PROPOSED PEDESTAL NOT SHOWN FOR CLARITY



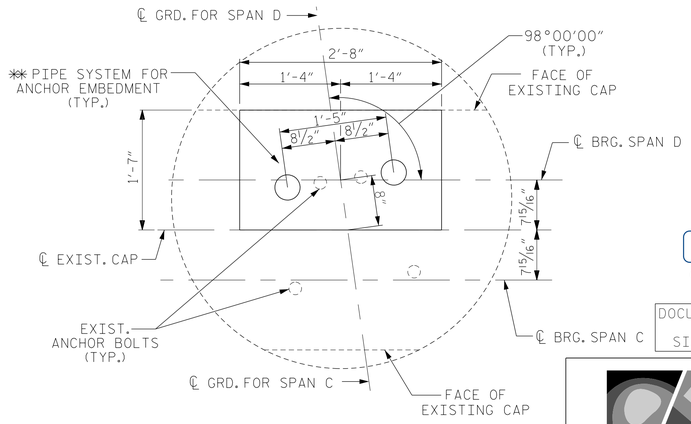
SECTION G-G

FOR DIMENSION AND REINFORCEMENT, SEE SECTION A-A
CONTRACTOR TO ESTABLISH HEIGHT. SEE STAGING NOTES.
APPROXIMATE HEIGHT IS 1'-8¼"±



SECTION H-H

TYPICAL FOR ALL PEDESTALS
* POSITION BARS TO AVOID EXISTING LONGITUDINAL REINFORCEMENT IN EXISTING CAP



DETAIL "A"

TYPICAL FOR ALL PEDESTALS
** FOR DETAILS SEE "PIPE SYSTEM DETAIL" ON SHEET S-14

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SUBSTRUCTURE
BENT 3
CONSTRUCTION STAGING

REVISIONS						SHEET NO.
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2			4			16

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5/9/2018
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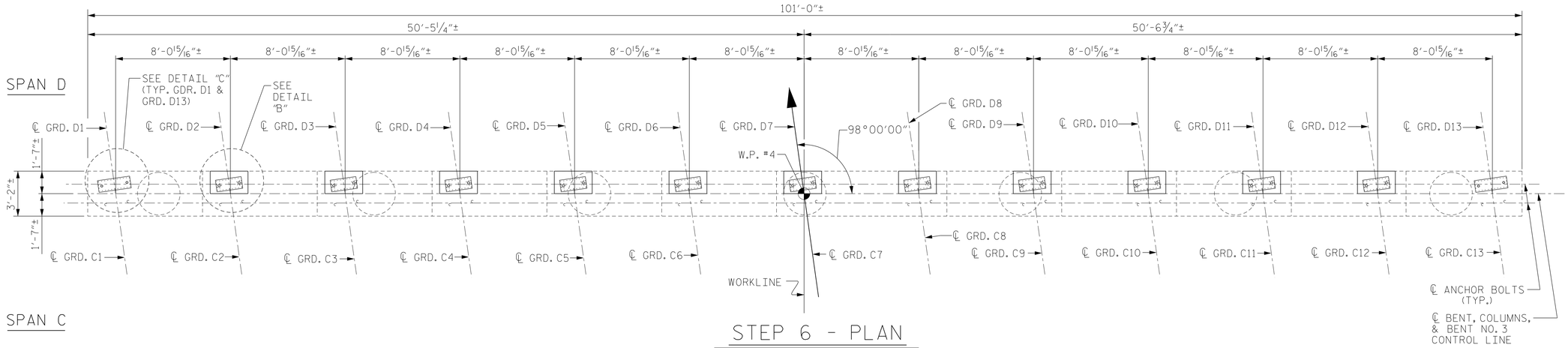
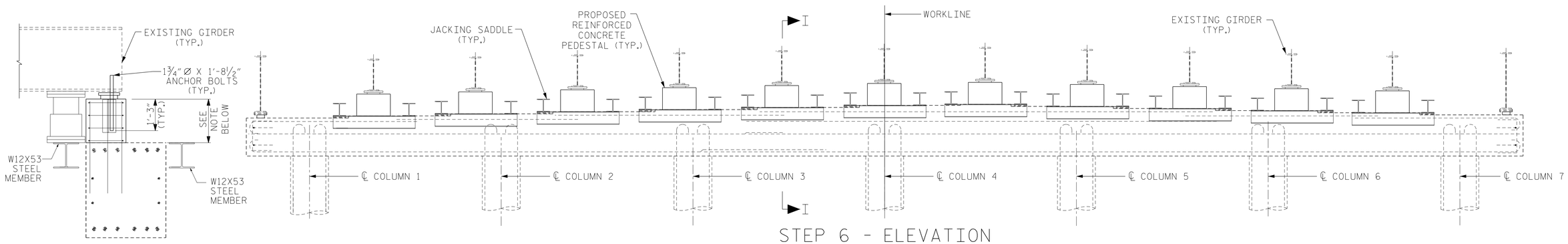


STEP 6 - PLAN

NOTE: JACKING SADDLE AND HYDRAULIC JACKING SYSTEM NOT SHOWN FOR CLARITY
FOR TYPICAL BENT CAP EPOXY COATING LIMTS, SEE DETAIL "D".



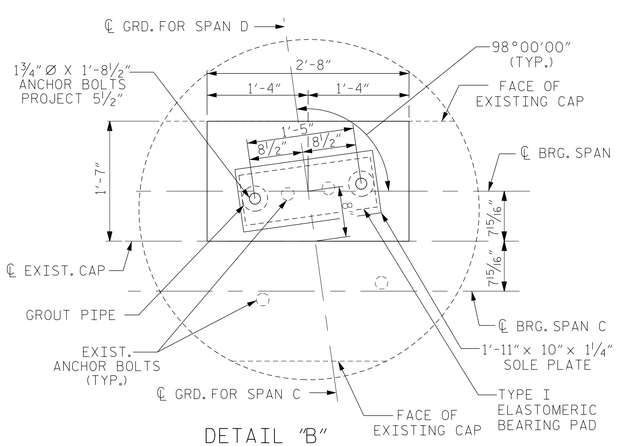
SECTION I-I

FOR DIMENSION AND REINFORCEMENT IN PEDESTAL, SEE SECTION G-G
CONTRACTOR TO ESTABLISH HEIGHT. SEE STAGING NOTES.
APPROXIMATE HEIGHT IS 1'-8¼"±

STEP 6 - ELEVATION

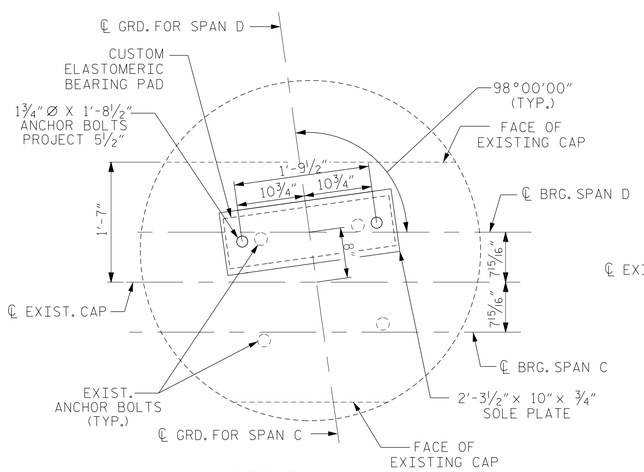
HYDRAULIC JACKING SYSTEM BEHIND PROPOSED PEDESTAL NOT SHOWN FOR CLARITY

✱EPOXY COAT ALL HORIZONTAL SURFACES OF CAP AFTER BEARINGS HAVE BEEN INSTALLED.



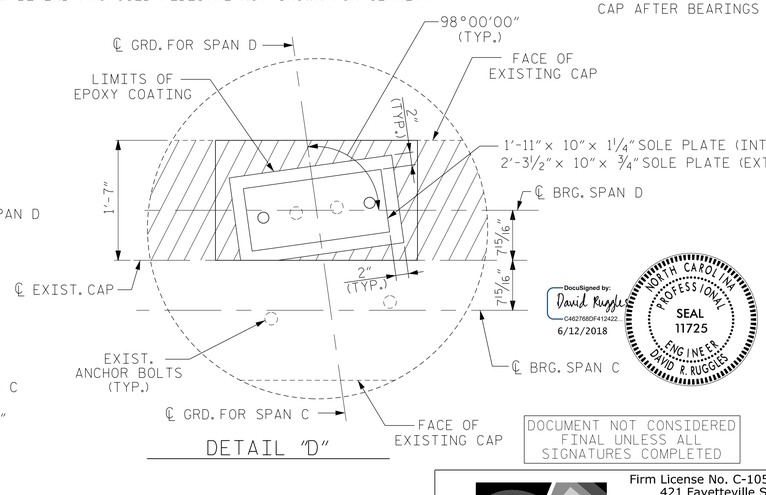
DETAIL "B"

TYPICAL FOR ALL PEDESTALS



DETAIL "C"

TYPICAL FOR EXTERIOR GIRDERS
ADHESIVE ANCHOR TO BE INSTALLED THROUGH HOLES IN BEARING PLATES.
CONTRACTOR SHALL ENSURE THAT HOLES ARE CLEAN AND SHALL INSTALL
ANCHORS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



DETAIL "D"

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WAKE COUNTY
BRIDGE NO. 316
SHEET 5 OF 5

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
BENT 3
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2			4			16

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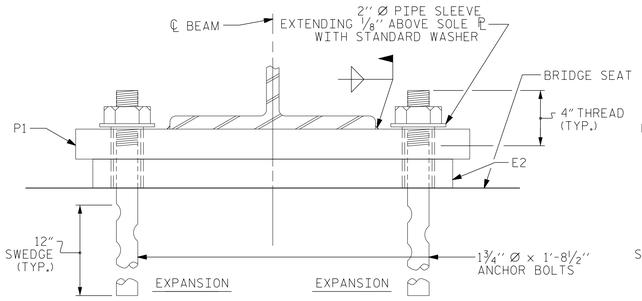
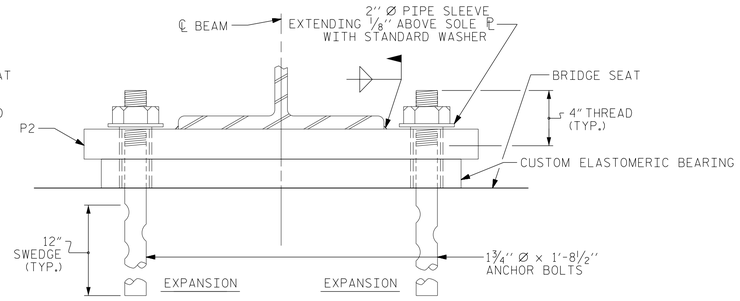
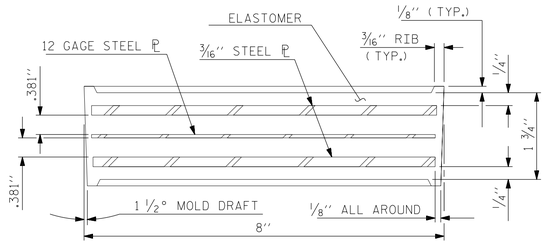


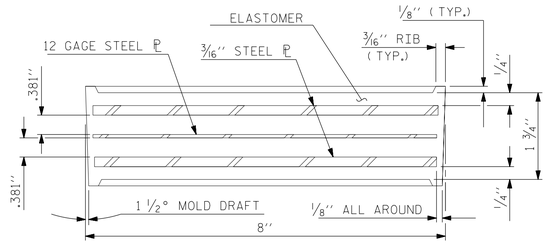
END VIEW



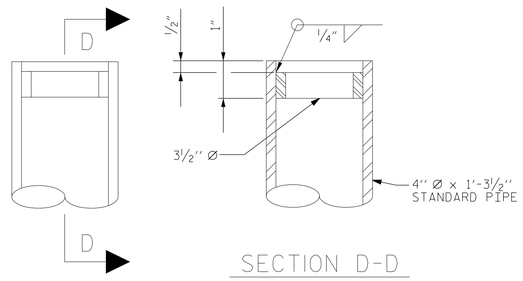
END VIEW



TYPICAL SECTION OF ELASTOMERIC BEARINGS

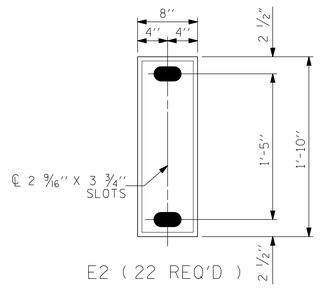


TYPICAL SECTION OF ELASTOMERIC BEARINGS



SECTION D-D

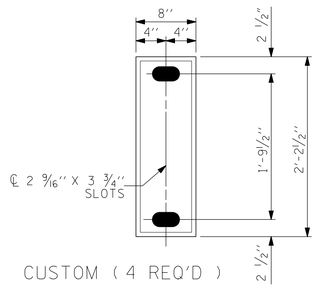
DETAIL "C"



E2 (22 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

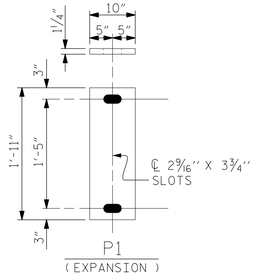
TYPE I



CUSTOM (4 REQ'D)

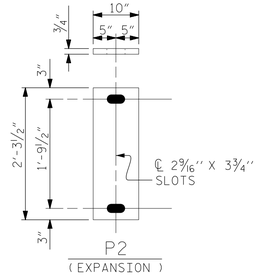
PLAN VIEW OF ELASTOMERIC BEARING

CUSTOM



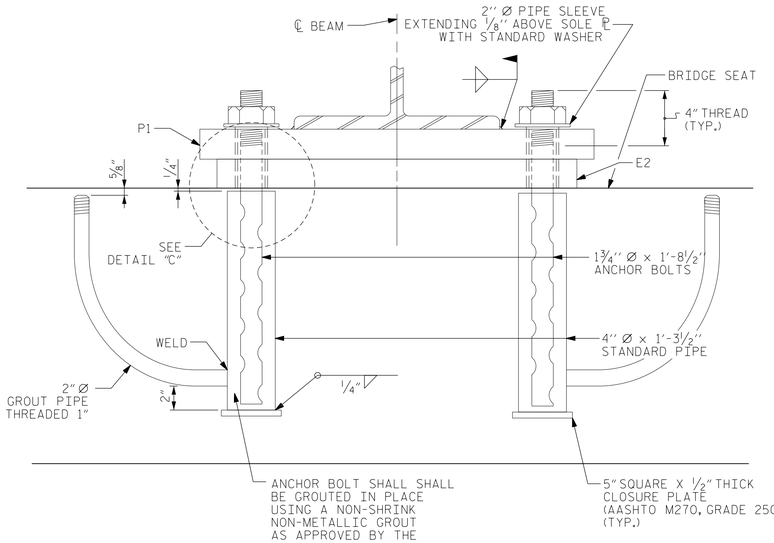
P1 (22 REQ'D)

SOLE PLATE DETAILS (P1)



P2 (4 REQ'D)

SOLE PLATE DETAILS (P2)



PIPE SYSTEM DETAIL

(INTERIOR GIRDERS ONLY)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE I	140 k
CUSTOM	140 k

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

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6/12/2018

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

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WAKE COUNTY

BRIDGE NO. 316

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 & 3

BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

DRAWN BY: E. PHELPS DATE : 06-17
CHECKED BY: D. RUGGLES DATE : 09-17
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 09-17

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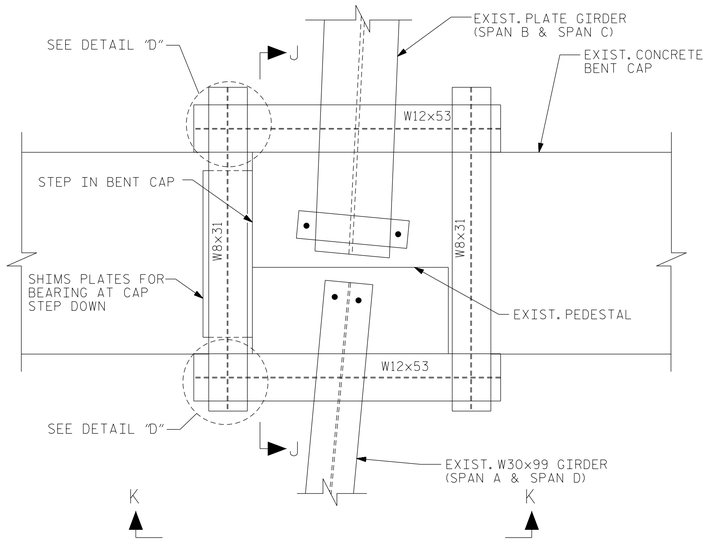
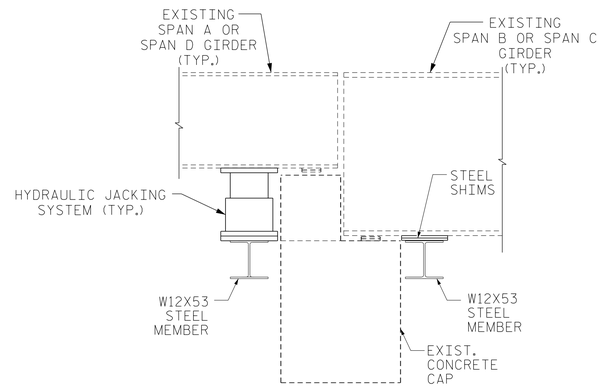
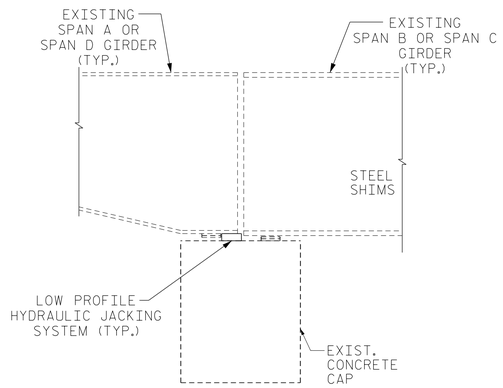


TYPICAL JACKING SADDLE PLAN



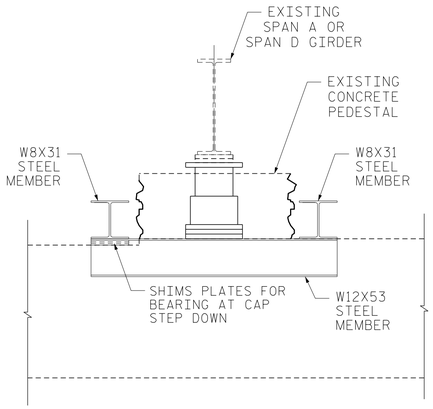
SECTION J-J

TYPICAL FOR INTERIOR GIRDERS



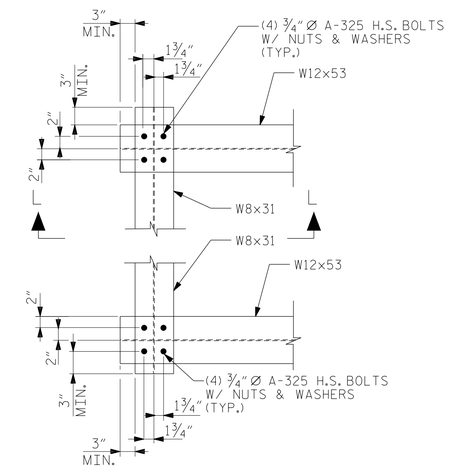
SECTION J-J

TYPICAL FOR EXTERIOR GIRDERS

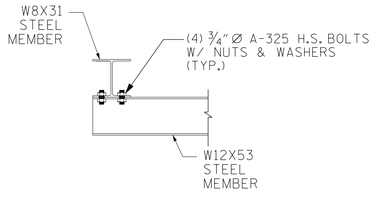


VIEW K-K

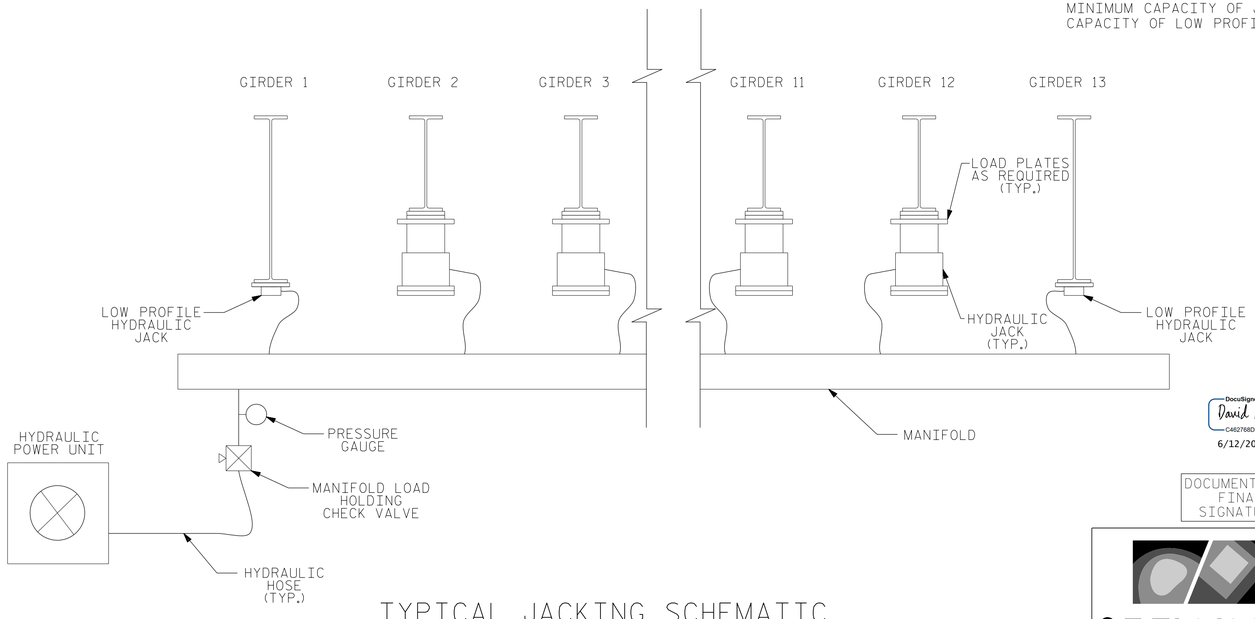
TYPICAL FOR INTERIOR GIRDERS



DETAIL "D"



SECTION L-L



TYPICAL JACKING SCHEMATIC

NOTES:

CONTRACTOR MAY USE ALTERNATE MEANS AND METHODS FOR JACKING OF EXISTING GIRDERS. IF ALTERNATE METHOD IS UTILIZED, CONTRACTOR SHALL SUBMIT PLANS AND DESIGN FOR APPROVAL. ALTERNATE JACKING DESIGN AND PLAN SUBMITTAL SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA.

ALL JACKS TO BE CONNECTED TO A MANIFOLD AS SHOWN IN JACKING SCHEMATIC TO ALLOW ALL GIRDERS TO BE JACKED EQUALLY AND SIMULTANEOUSLY.

JACKING SCHEMATIC SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.

SPAN A AND SPAN D BEAMS TO BE RAISED A MAXIMUM OF ¼".

FOR GIRDERS 2 THRU 12, RUN LOCKING COLLARS DOWN ON EACH JACK TO HOLD SPAN IN RAISED POSITION. FOR GIRDERS 1 AND 13, INSTALL BLOCKING TO HOLD SPAN IN RAISED POSITION.

COMPLETE CONSTRUCTION OF NEW PEDESTALS AND INSTALLATION OF NEW BEARINGS.

AFTER CONCRETE HAS REACHED A MINIMUIM COMPRESSIVE STRENGTH OF 3000 PSI, RESTORE HYDRAULIC PRESSURE TO JACKS AND RELEASE LOCKING COLLARS AT GIRDERS 2 THRU 12 AND REMOVE BLOCKING FROM GIRDERS 1 AND 13.

SLOWLY RELEASE JACK PRESSURE TO LOWER THE SPAN ON TO THE NEW SUPPORTS.

MINIMUM CAPACITY OF JACKS FOR GIRDERS 2 THRU 12 SHALL BE 73 KIPS. MINIMUM CAPACITY OF LOW PROFILE JACKS AT GIRDERS 1 AND 13 SHALL BE 76 KIPS.

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R RUGGLES

DocuSigned by: David Ruggles C4627680F412422...

6/12/2018

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PROJECT NO. 17BP.5.H.4

WAKE COUNTY

BRIDGE NO. 316

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 & 3

BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			16

DRAWN BY:	E. PHELPS	DATE : 06-17
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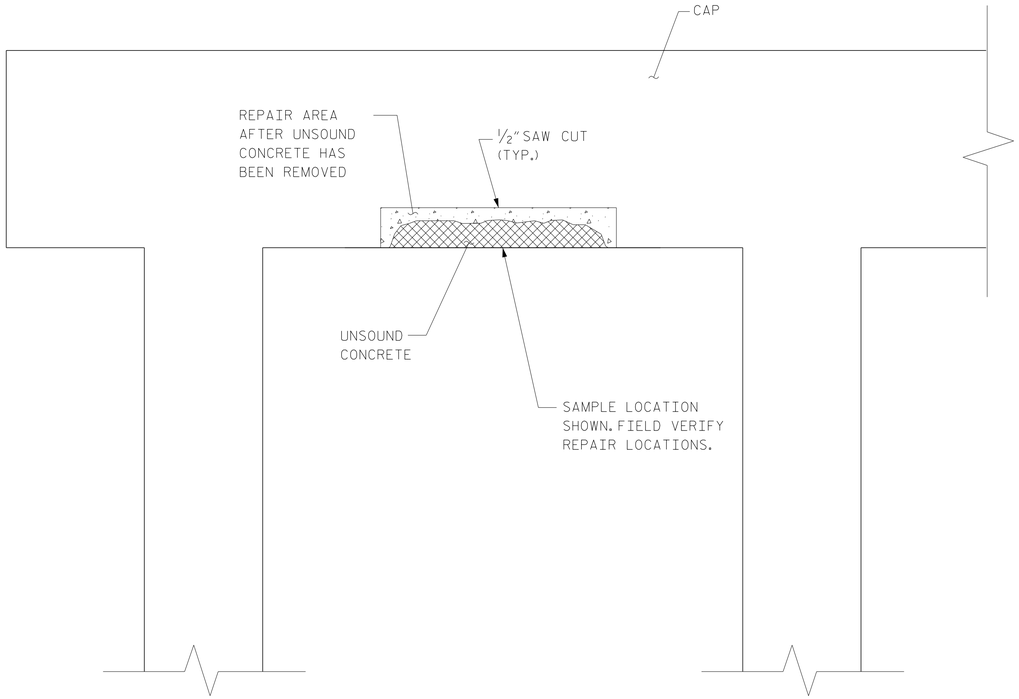


TYPICAL BENT REPAIR DETAIL

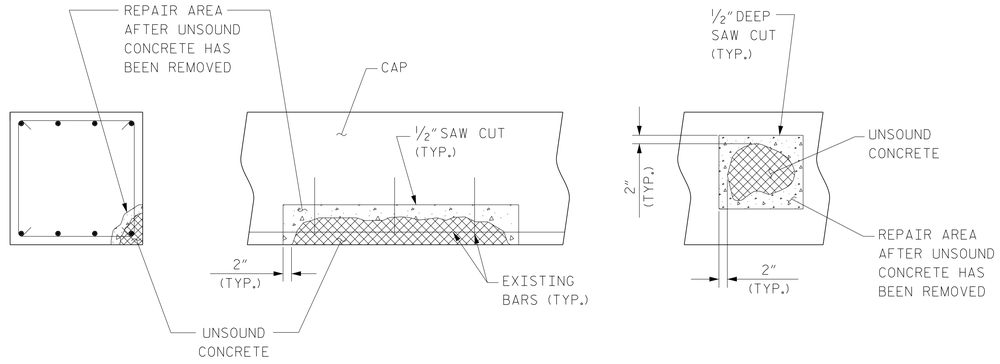
NOTE:

CONTRACTOR SHALL PERFORM A FIELD INSPECTION WITH ENGINEER TO ESTABLISH AREAS TO BE REPAIRED. REPAIR AREAS TO BE MARKED WITH FIELD PAINT.

ITEMS TO BE REPAIRED INCLUDE END BENTS, BENT CAPS, BENT COLUMNS, AND ANY OTHER ITEMS SPECIFIED BY THE ENGINEER.

BILL OF MATERIAL

	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION
	CU. FT.	LIN. FT.
END BENT 1	35	
BENT 1	35	
BENT 2	10	
BENT 3	80	
END BENT 2	0	
CONTINGENCY	40	125
TOTAL	200	125



SECTION ELEVATION

CORNER REPAIR FACE REPAIR

REPAIR SEQUENCE:

1. SOUND CONCRETE TO DETERMINE EXTENT OF REPAIR LOCATION.
2. REMOVE SURFACE CONCRETE TO VERIFY SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL. SAW CUT AROUND REPAIR AREA TO A NOMINAL DEPTH OF ½".
3. REMOVE CONCRETE WITHIN SAW CUT AREA TO MINIMUM ½" DEPTH. (PICTURE REQUIRED).
4. USE A WIRE BRUSH TO CLEAN ALL EXPOSED REINFORCING STEEL. FOR BARS WITH MORE THAN 10% SECTION LOSS SPLICE AND SECURELY TIE SUPPLEMENTAL REINFORCING BARS AS NEEDED.
5. REMOVE ALL LOOSE OR WEAKENED MATERIAL THEN CLEAN THE REPAIR AREA OF DIRT, GREASE, OIL, AND FOREIGN MATTER. (PICTURE REQUIRED)
6. PREPARE SURFACE AND PLACE APPROVED REPAIR MATERIAL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. (PICTURE REQUIRED)

NOTE:

FOR REPAIRS OVER TRAFFIC AND SHALLOW REPAIRS THAT DO NOT ENGAGE REINFORCEMENT, ANCHOR PATCH MATERIAL USING ¼" GALVANIZED BOLTS, EPOXY ANCHORED WITH 2" EMBEDMENT. PLACE IN A 6" GRID. USE A LATEX OR EPOXY PATCH MATERIAL FOR IMPROVED BOND.

CAP REPAIR DETAILS AND PROCEDURE

PROJECT NO. 17BP.5.H.4

WAKE COUNTY

BRIDGE NO. 316

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DocuSigned by: David Ruggles C462768DF412422...

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CAP REPAIR DETAILS

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1			3			TOTAL SHEETS
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DESIGN ENGINEER OF RECORD:	D. RUGGLES	DATE : 09-17

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5/9/2018
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USER:ephelps

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

REV. 6-16-95 EEM (J) RGW REV. 5-7-03 RWW (J) JTE REV. 10-1-11 MAA (J) GM
REV. 8-16-99 RWW (J) LES REV. 5-1-06 TLA (J) GM

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